SIEMENS-ALLIS

Installation • Operation • Maintenance • Parts

Instructions

LA-3200A, LA-4000A &
LA-4000B (Unfused)
Air Circuit
Breakers
SG-3038

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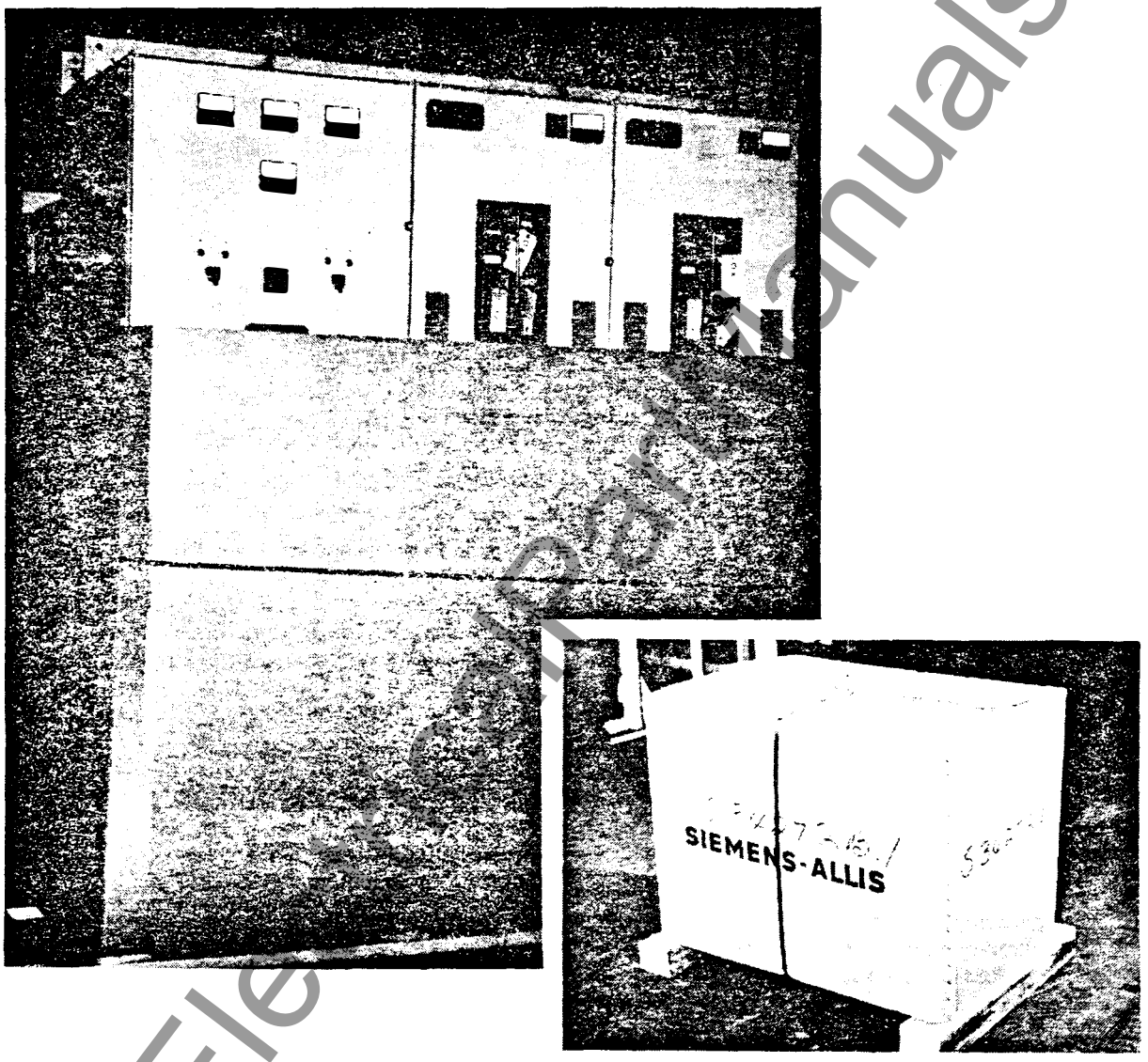


Typical Shipping Methods Used With "LA" Breakers

The information contained within is intended to assist operating personnel by providing information on the general characteristics of equipment of this type. It does not relieve the user of responsibility to use sound engineering practices in the installation, application, operation and maintenance of the particular equipment purchased.

If drawings or other supplementary instructions for specific applications are forwarded with this manual or separately, they take precedence over any conflicting or incomplete information in this manual.

INSTALLATION

INTRODUCTION

The type "LA" air circuit breakers may be furnished for mounting in either of two ways. They may be used in metal-enclosed switchgear of the drawout type, or in individual enclosures (drawout type). All "LA" breakers are completely assembled, tested, and calibrated at the factory in a vertical position and must be so installed to operate properly. Customer's primary connections should be adequately braced against the effects of short circuit currents to prevent overstressing the breaker terminals.

FIELD SERVICE OPERATION

Siemens-Allis can provide competent, well-trained Field Service Representatives to provide technical guidance and advisory assistance for the installation, overhaul, repair and maintenance of Siemens-Allis equipment, processes and systems. Contact regional service centers, sales office or factory.

WARRANTY

Siemens-Allis "LA" air circuit breakers are warranted to be free of defects in material and workmanship for a period of one year from date of initial operation but not more than eighteen months from date of shipment by company. This warranty is limited to the furnishing of any part which to our satisfaction has been proven defective. Siemens-Allis will not in any case assume responsibility for allied equipment of any kind. See Siemens-Allis Warranty Form 20160.

RECEIVING AND INSPECTION FOR DAMAGE

Immediately upon receipt of this equipment, carefully remove all packing traces and examine parts, checking them against the packing list and noting any damages incurred in transit. If such is disclosed, carrier inspection must be arranged for by consignee within 15 days of receipt of equipment. If equipment shipped F.O.B. Shipping Point, consignee must file a claim with the carrier. If equipment is shipped F.O.B. Destination, the consignee must obtain the original of the carrier inspection report and notify Siemens-Allis immediately.

CAUTION Do not accept the statement from any driver that the damaged equipment was not properly packaged by shipper.

Do not sign Bill of Lading without notation of visible damage if observed. Our equipment packaging meets the rigid requirements established by the trucking industry. You must obtain carrier inspection within 15 days of receipt on damaged equipment.

Two shipping methods are used with "LA" breakers:

1. Individually skidded with protective covering for domestic shipments.
2. Within a cubicle on export orders when part of a switchgear lineup. Breakers shipped in their cubicles are blocked to prevent accidental tripping during shipment. Note all caution tags, remove blocking bolts, and open breaker contacts before installation.

STORAGE

When breakers are to be put into storage, they should be wrapped or covered with a non-absorbent material to provide protection from plaster, concrete dust, moisture or other foreign matter. Breakers should not be exposed to the action of corrosive gases or moisture. In areas of high humidity or temperature fluctuations, space heaters or the equivalent should be provided.

INSTALLATION

The "LA" air circuit breaker is completely adjusted, tested, and inspected before shipment, but a careful check should be made to be certain that shipment or storage has not resulted in damage or change of adjustment. Circuit breakers should be installed in a clean, dry, well-ventilated area in which the atmosphere is free from destructive acid or alkali fumes. Before installing, make certain that the breaker contacts are in the open position, and primary disconnect fingers are lubricated with Siemens-Allis electrical contact lubricant supplied with accessories.

1. Before the breaker is installed in position, make sure racking clevis' (Fig. 1) are in test or connect position, then close it manually by the maintenance closing method (see MAINTENANCE AND ADJUSTMENTS, page 12) to check proper functioning of the mechanism and contacts.

   During the closing operation, observe that the contacts move freely without interference or rubbing between movable arcing contacts and parts of the arc chutes. Then refer to OPERATION, page 5 for a detailed description of the circuit breaker operating characteristics before putting the breaker in service.

2. Trip units and accessory devices should receive a thorough check prior to placing the breaker in service to be certain that adjustments are proper and parts are not damaged. Refer to Static Trip Device Instruction Book SG-3098 supplied with this equipment or to LimiTrip Book SG-3108.

3. Breakers are equipped with a drawout interlock to prevent movement of a closed breaker into or out of the connected position. See SPRING DISCHARGE INTERLOCK, page 10 for a description of the interlock. Its operation should be checked before the breaker is energized.

4. Upon completion of the installation inspection, the control wiring, if any, is checked and the insulation tested, then the breaker is ready to be energized.

LIFT BAR AND RAIL EXTENSIONS

The lifting bar connects as shown. Always lift with extreme caution to prevent damage to breaker. In particular, watch that the secondary disconnects clear the rail extension. References: Lifting bar assembly: 18-727-837-501. Extension rail: 18-193-732-502. See Page 4.

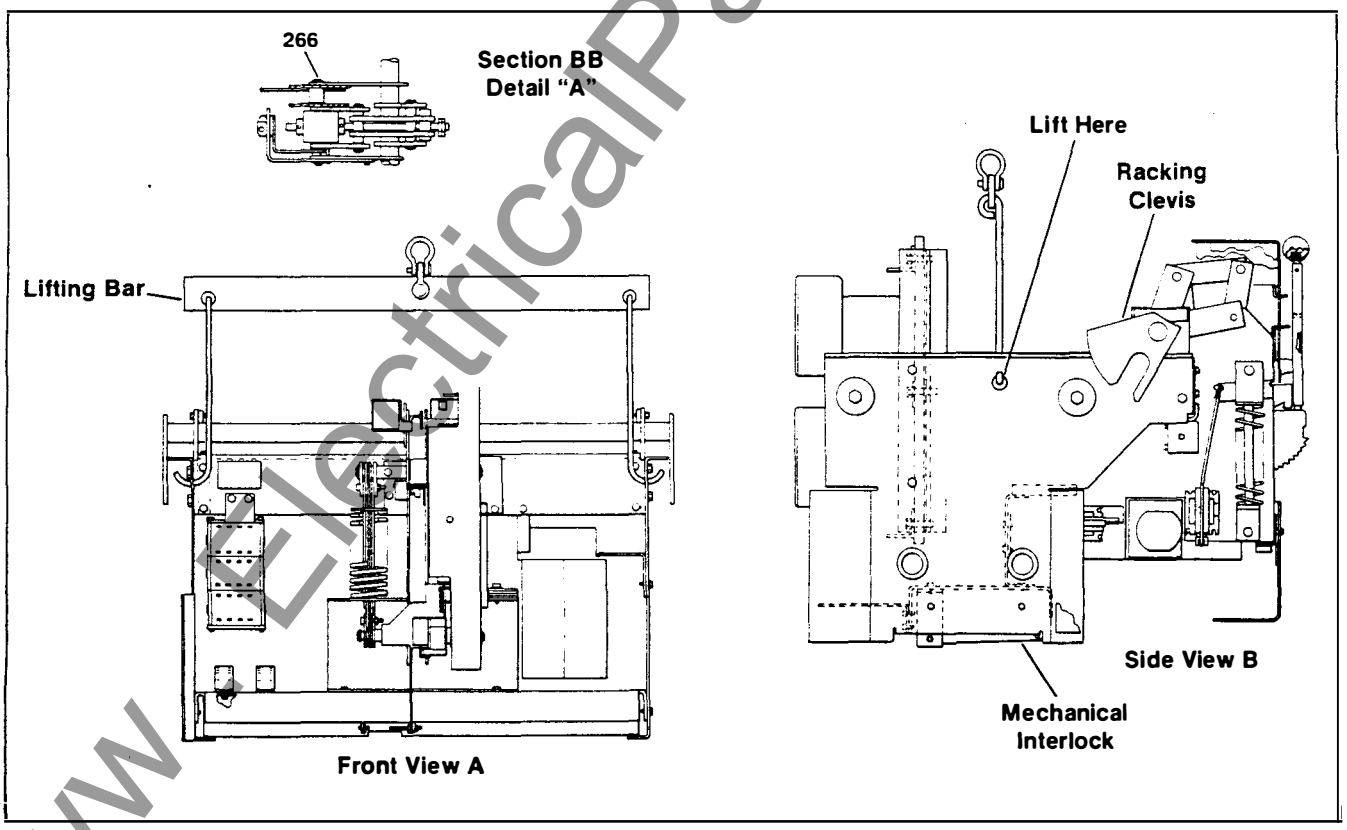


Figure 1. Typical Racking Mechanism and Drawout Interlock

INSTALLATION

CAUTIONS TO BE OBSERVED IN THE INSTALLATION AND OPERATION OF "LA" CIRCUIT BREAKERS

1. Never try to remove the breaker from the compartment or reinsert into the compartment without using the guide rail extensions supplied. See page 4.
2. Read the Instruction Book before installing or making any changes or adjustments on the breaker.
3. As the closing springs on stored-energy breakers may be charged with the breaker contacts in either the open or closed position, extreme care should be taken to discharge the springs before working on the breaker.
4. When charging manually-operated breakers, always hold handles firmly until it is returned to the normal vertical position
5. Check current ratings against single line diagram to assure that breakers are properly located in switchgear at installation.
6. Check the alignment of the secondary disconnect fingers to ensure against misalignment due to possible distortion of fingers during shipment and handling.
7. Once the breaker is energized, it should not be touched, except for operating, since most of the component parts are also energized.

HANDLING INSTRUCTIONS

INSERTING CIRCUIT BREAKER

1. Mount extension rails (A) as shown. Tighten catches (B) to secure rails.
2. Lower circuit breaker onto rails, checking wheel alignment to rails.
3. Roll breaker to disconnect position and remove extension rails. Safety lock (C) prevents accidental removal of breaker from cell.
4. Use crank to rack breaker into cell.
5. Check panel shutters (D) for free movement before closing panel.

REMOVING CIRCUIT BREAKER

1. Mount extension rails to unit as described under. "Inserting Circuit Breaker."
2. With circuit breaker in disconnect position, release breaker interlock and pull breaker out.
3. Pull on safety lock handle to fully release breaker from cell.
4. Roll breaker out onto extension rails and lift free of unit.

MAINTENANCE

Occasional checking and cleaning of the breaker will promote long and trouble-free service. A periodic inspection and servicing on an annual basis should be included in the breaker maintenance routine or at shorter intervals if necessary due to environmental or operating conditions.

If the circuit breaker is not operated during extended periods, the breaker should not remain in either the closed or open position any longer than six months. Maintenance opening and closing operations should be made to ensure freedom of movement of all parts.

DANGER!

Do not work on energized equipment. Only qualified personnel should be permitted near energized equipment.

Plan the time for maintenance with operating personnel so that the switchgear can be de-energized and safely grounded.

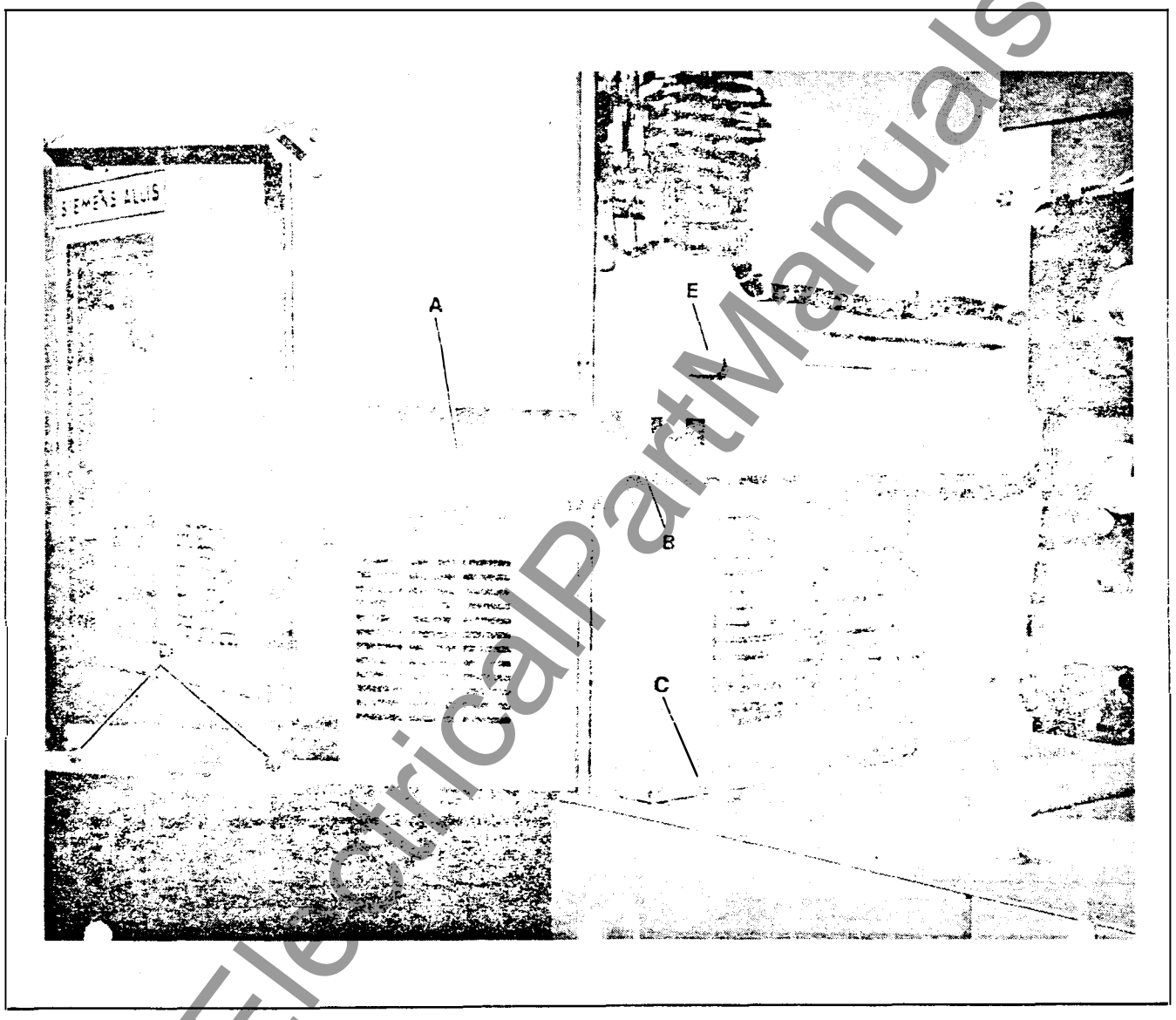


Figure 2. Inserting and Removing Circuit Breaker

DESCRIPTION

The LA-3200 air circuit breaker has a maximum continuous current rating of 3,200 amperes, and an interruption rating of 65,000 amperes at 254, 508, or 635 volts 60 Hz., when used with the short time delay trip device. With instantaneous trip device, the interruption rating is 85,000 amperes at 254 volts, 65,000 amperes at 508 volts, and 65,000 amperes at 635 volts.

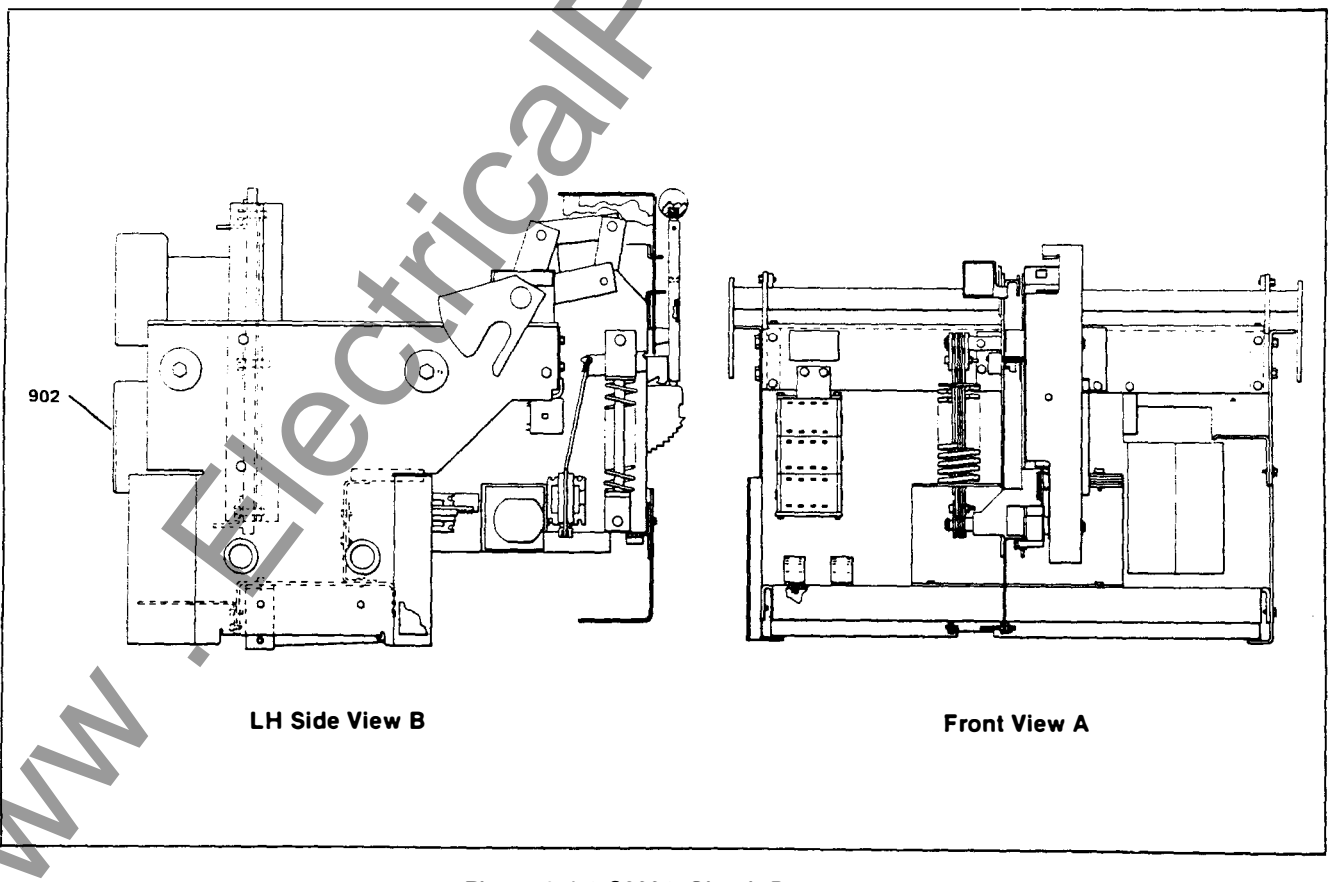
The LA-4000A and B air circuit breakers have a continuous current rating of 4,000 amperes and an interruption rating of 85,000 amperes when used with the short time delay trip device. The interruption rating with instantaneous trip device is 130,000 amperes at 254 volts, 85,000 amperes at 508 volts, and 85,000 amperes at 635 volts. All currents are symmetrical amperes and voltages are maximum.

Three configurations of the operator are available for charging the closing springs. These are:

A. manual charging
B. electrical charging
C. combination manual-electrical charging.

All operators are identical except for the means of supplying energy to the closing springs.

A double-toggle, trip-free mechanism is used; that is, the breaker contacts are free to open at any time, if required, regardless of the position of the mechanism.



LH Side View B

Front View A

Figure 3. LA-3200A Circuit Breaker

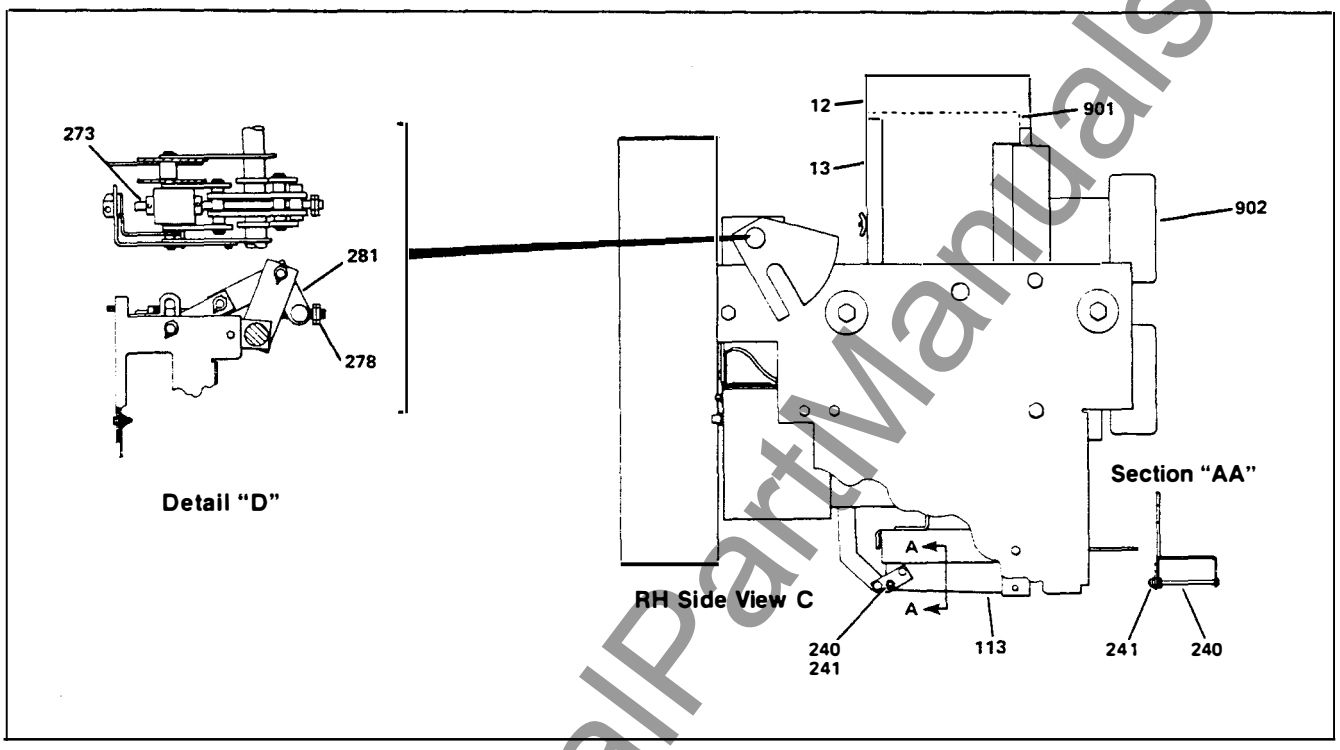


Figure 3. LA-3200A Circuit Breaker (Continued)

A. MANUALLY OPERATED BREAKER

(REFER TO FIGURE 4 AND TABLE 1)

The breaker has a center-mounted frame so many of the latches and links are arranged in pairs; for descriptive purposes they will be referred to as single items. Detail "A" shows the position of the trip latch and toggle linkage when the breaker is open and the closing springs are discharged. Movement of the charging handle downward rotates closing cam (204) against roller (168), thus pivoting closing cam (159) about pin (215) and extending the closing springs thru link (163) and spring hanger (157). Rotation of cam (159) allows roller (181) in toggle linkage to be moved into position shown in Detail "B". Kickoff springs (199) move rollers away from stop block (171), then the toggle linkage is moved by torsion spring until latch (175) clear trip latch (153A). Spring (155) causes trip latch (153A) to reset under latch (175). Trip flap (153B) should normally stop against the front surface of latch (175).

When the closing springs are fully charged, roller (168) engages latch (148). Charging cam (204) engages pawl (146) in such a manner that the charging cam must complete the charging stroke before it can return to its normal position.

With the charging handle in its normal upright position, the breaker can be closed. By pressing firmly on hood (149), latch (148) will disengage roller (168) and closing springs cause closing cam (159) to rotate against the toggle rollers (181) moving the toggle into its upright position, shown in detail "C". The closing cycle can be interrupted at any point by operation of one of the tripping means, which cause rotation of trip latch (153A) to a position that releases latch (175) allowing toggle linkage to collapse to the position shown in detail "A".

Manual opening of the breaker is accomplished by pressing in manual trip bar (188). This bar engages the top of trip flap (153B) which is in turn arranged to disengage the trip latch (175).

Table 1. Operating Procedure — Manually Operated Breakers

Operation	Procedure
Charging Springs	Make sure that the racking clevis' are in either test or connect position. Never pull charging handle down with clevis' in disconnect position as shown in Figure 1.
	Pull charging handle down all the way (approximately 120°) and return to normal vertical position. (Engagement of pawl with the ratchet teeth prevents handle reversal until the downward stroke is completed.)
Closing	Push down firmly on spring-release latch hood (149) after handle is returned to normal vertical position.
Tripping	Push in manual trip bar (188),
	OR
	If shunt trip is provided, operate remote trip control switch (CST). See Figure 5.

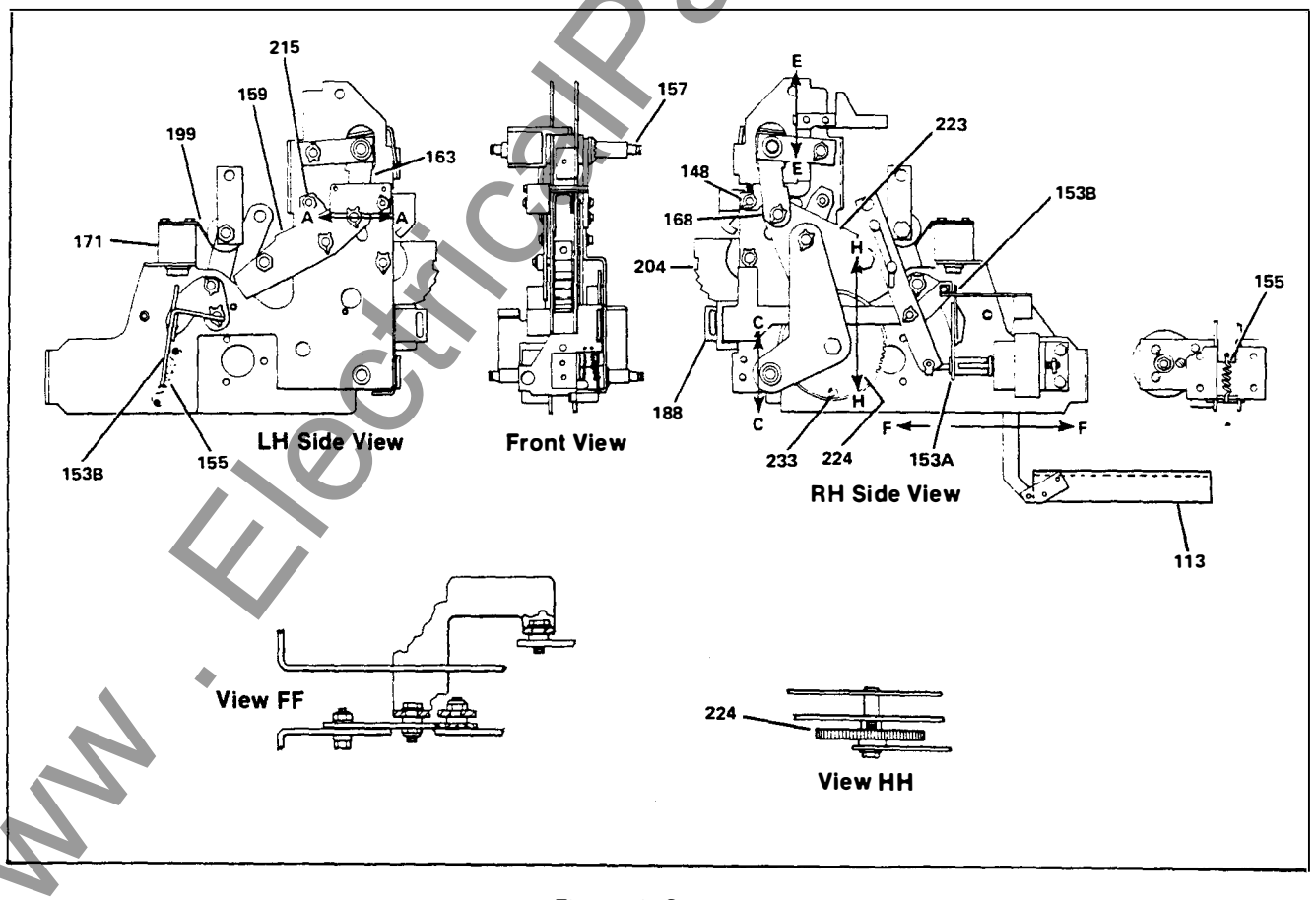


Figure 4. Operator

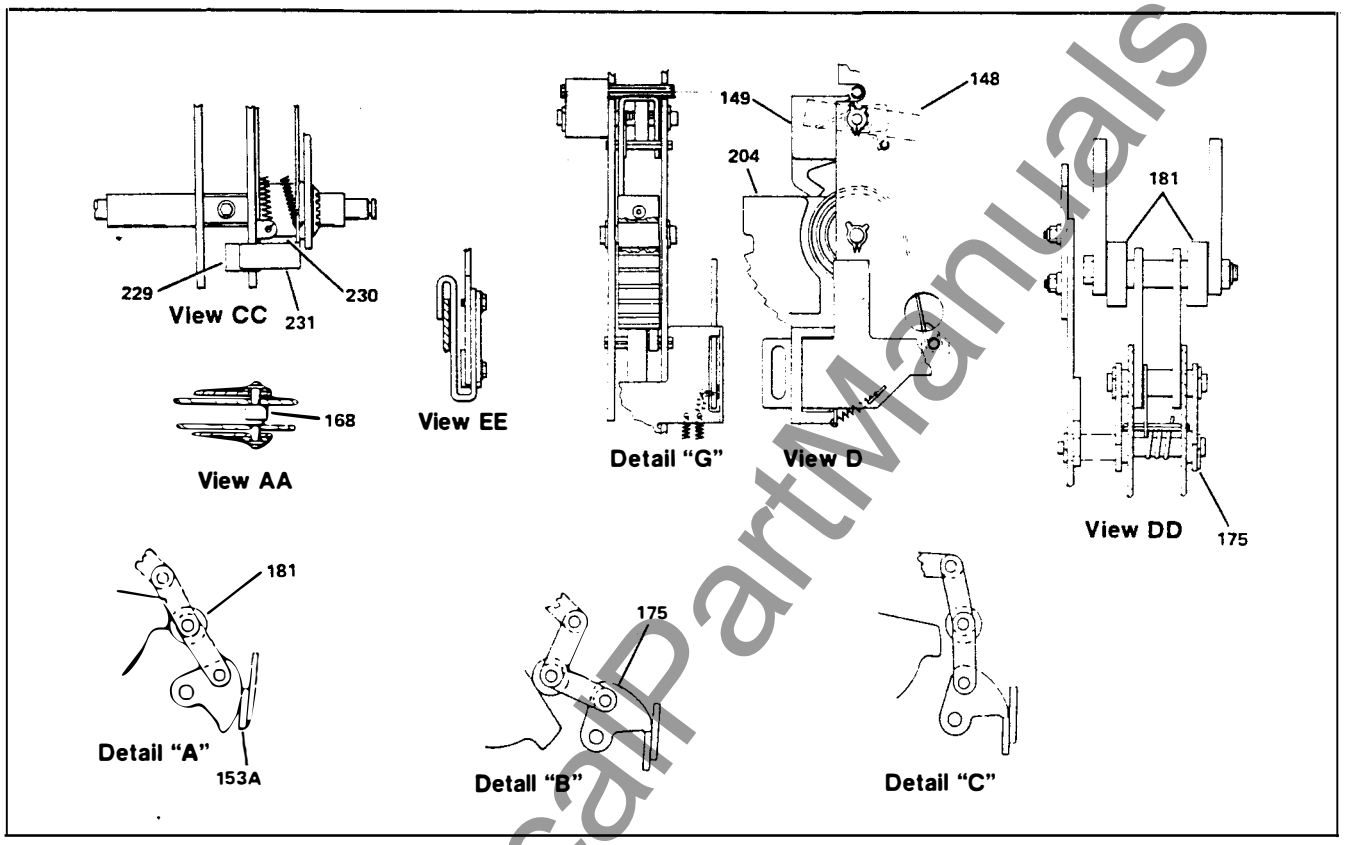


Figure 4. Operator (Continued)

B. ELECTRICALLY OPERATED BREAKER

(REFER TO FIGURES 1, 3 and 4)

The mechanism of the electrically operated breaker is the same as the manually operated breaker except that the manual charging handle is replaced by a motor and gear system. With power available to the control circuit, closing the motor control switch (MI) will start the automatic charging cycle. The motor gear box pinion rotates gear (224) counterclockwise, cam follower (233) engages an arm of wind and close cam (223) which rotates the cams in the same manner as for the manually charged breaker. When the wind and close cam (223) reaches its charged position, the back of the cam engages switch lever (229) rotating the lever away from the switch operator. Gear switch lever (231) will still be holding the switch in the operate position, and the motor will continue to run until the roll pins on the side of gear (224) lifts lever (231) clear, releasing the motor cutoff switch (MCO). When the MCO switch opens, the motor stops, and the closing coil circuit is set up through one side of the MCO switch.

The breaker can now be closed by depressing the latch hood (149) or by energizing the closing coil (CC) through the external close control switch (CSC). When the close circuit is energized, the "Y" relay is energized and opens the "Y" contact in the motor circuit, thus preventing "pumping" or repeated attempts to charge the closing springs.

If the close circuit CSC switch is opened, the motor will automatically recharge the closing springs, if power is available for the motor circuit. The close coil circuit is always interrupted by the motor cut-off switch MCO. Trip free operation of the mechanism, discharging the springs on a closed breaker is prevented by completing the close coil circuit through an auxiliary contact of the breaker.

Table 2. Operating Procedure — Electrically Operated Breakers

CAUTION Make sure that racking clevis' (Fig. 1) are in test or connect position before charging springs. Do not charge springs with clevis' in disconnect position as this could cause damage to breaker.

Operation	Procedure
Charging Springs	Energize control circuit. Move motor control switch on front of breaker to "ON" position.
Closing	After springs are charged, actuate remote close control switch (CSC).
	OR
	Push down firmly on spring-release latch hood (149).
Tripping	Actuate remote trip control switch (CST).
	OR
	Push in manual trip bar (188).

C. COMBINATION OPERATED BREAKER

The combination manually and electrically operated breaker includes both the motor-gear charging system as well as the manual charge handle.

NOTE Manual Handle must be in vertical position during electrical charging.

DRAWOUT INTERLOCK

The breakers include as integral parts the mechanism to rack the breaker in or out of the cubicle compartment, interlocking to prevent racking a closed breaker into or out of the connected position, and interlocking to prevent withdrawing a breaker from the cubicle while the closing springs are charged.

RACKING MECHANISM

Refer to page 4. With the breaker resting on the cubicle rail the following sequence should be used to rack the breaker into the cubicle.

CAUTION Never install or remove a breaker from the compartment without having rail extensions in place. See page 4.

CAUTION On electrically operated breakers, be sure motor control switch on the front of the breaker is off.

1. Push trip bar in, lower interlock slide and insert racking crank.

NOTE Interlock slide cannot be opened unless manual trip bar is pressed in. While the trip bar is pressed in, the breaker is in the TRIP-FREE position and cannot be closed.

2. With the racking crank, rotate the racking screw (273) until the racking shaft is in the disconnected position. The clevis can now engage the racking pins (E) in the cubicle. The breaker should now be pushed along the rail into the DISCONNECTED position. Double check that the racking clevis does engage the pins in the cubicle.

3. Check to see that the floor interlock (Item 113) is clear before racking.
4. Counterclockwise rotation of the racking screw will rack the breaker into the TEST position. At the TEST position, the floor mounted interlock is clear and the cover slide interlock can be closed, allowing the trip bar to extend and the breaker can be operated. (Between the TEST position and the CONNECTED position, the slide interlock will engage the stop pin and the breaker will be tripped through the interlock mechanism, and the cover slide cannot be closed.)

   In the CONNECTED position, the slide interlock will clear the stop pin of the racking toggle and the floor interlock is clear allowing the breaker to be closed. This prevents moving a closed breaker into or out of the CONNECTED position.
5. To withdraw the breaker from the CONNECTED position, the procedure is the same only the racking screw rotation is clockwise.
6. Before attempting to operate the breaker, the position of the device should be checked with reference to the marking in the cubicle, to be certain that it is fully connected. Two stop nuts are provided on the racking screw to set the connected position. These are adjusted by setting the angle of the racking clevis, as shown in Detail "D" of Figure 3, and by tightening the nuts against the "L" links (281) the two nuts (278) should be then locked against each other.

CAUTION To avoid damage to the racking mechanism, do not rotate the racking crank in the counterclockwise direction when in the connected position.

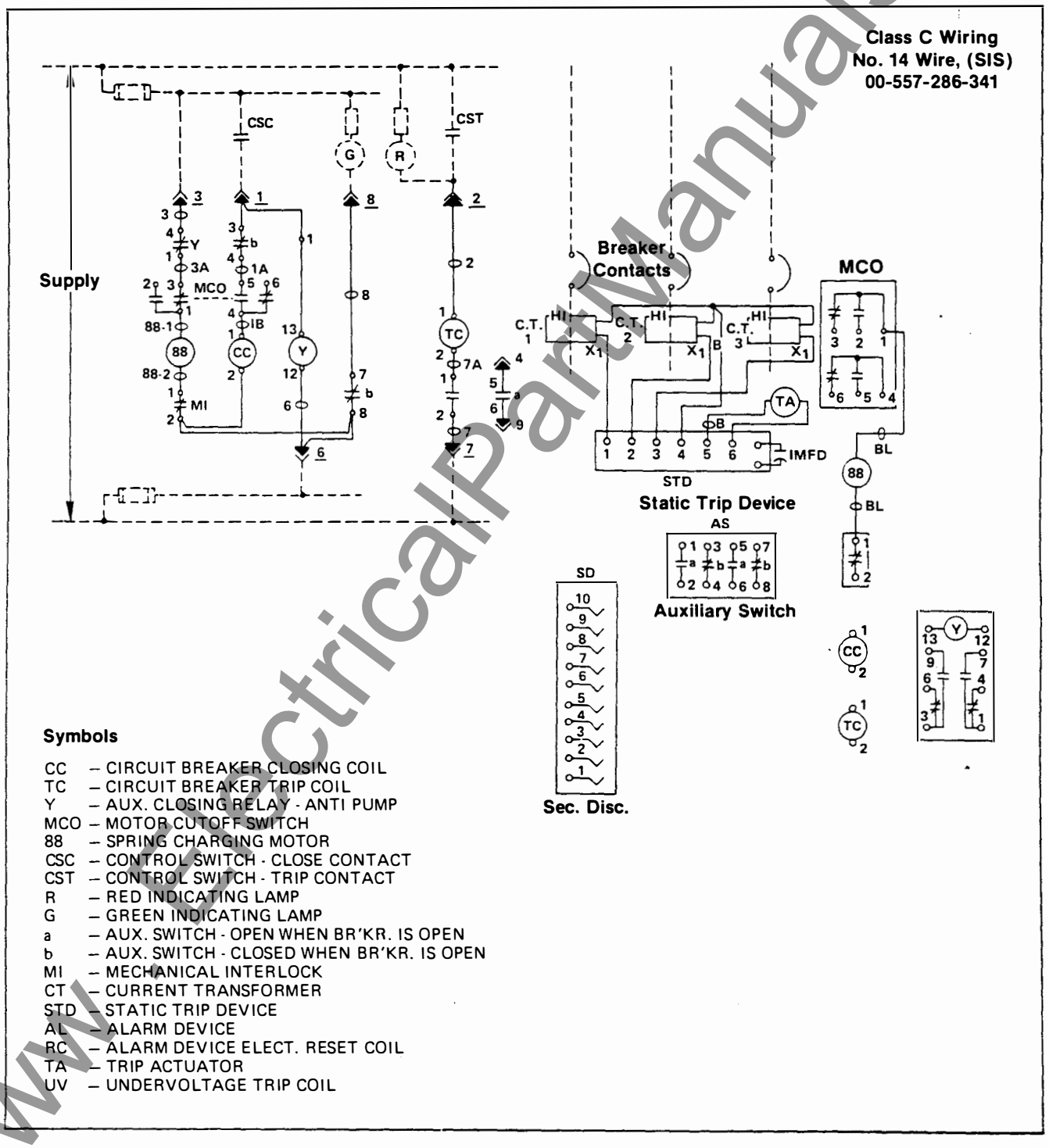
SPRING DISCHARGE INTERLOCK

When racking the breaker out to the DISCONNECTED position, the closing springs will automatically discharge, at or before reaching the disconnect position. The barrel nut engages the spring interlock. This in turn connects to the manual close hood which releases the closing springs.

CAUTION On manually charged breakers, the close hood is interlocked to the manual charge cam, and must be clear before racking the breaker to the disconnect position.

NOTE Manual charge handle must be in vertical position during racking and racking mechanism must be returned to the test position before closing springs can be charged while breaker is removed from cubicle.

Note also that the spring discharge interlock produces a TRIP-FREE operation in which all of the stored energy of the springs is dissipated in the mechanism. It is preferable to turn the motor control switch off in the TEST position, close the breaker normally in that position, then rack out in the normal manner.



Symbols

CC – CIRCUIT BREAKER CLOSING COIL
TC – CIRCUIT BREAKER TRIP COIL
Y – AUX. CLOSING RELAY - ANTI PUMP
MCO – MOTOR CUTOFF SWITCH
88 – SPRING CHARGING MOTOR
CSC – CONTROL SWITCH - CLOSE CONTACT
CST – CONTROL SWITCH - TRIP CONTACT
R – RED INDICATING LAMP
G – GREEN INDICATING LAMP
a – AUX. SWITCH - OPEN WHEN BR'KR. IS OPEN
b – AUX. SWITCH - CLOSED WHEN BR'KR. IS OPEN
MI – MECHANICAL INTERLOCK
CT – CURRENT TRANSFORMER
STD – STATIC TRIP DEVICE
AL – ALARM DEVICE
RC – ALARM DEVICE ELECT. RESET COIL
TA – TRIP ACTUATOR
UV – UNDERVOLTAGE TRIP COIL

Figure 5. Typical Wiring Diagram — Electrically Operated Breakers

MAINTENANCE

DANGER!

Do not work on energized equipment. Unauthorized personnel should not be permitted near energized equipment.

Occasional checking and cleaning of the breaker will promote long and trouble-free service. A periodic inspection and servicing, normally at intervals of one year, should be included in the maintenance routine. Circuit breakers located in areas subject to acid fumes, cement dust, or other abnormal conditions, require more frequent servicing. After a severe overload interruption, the breaker should be inspected.

If the circuit breaker is not operated during extended periods, it should not remain in either the closed or open position any longer than six months. Maintenance opening and closing operations should be made to ensure freedom of movement of all parts.

A suggested procedure to follow during maintenance inspections is given below.

1. De-energize the primary and control circuits.
2. Rack breakers to the disconnected position.
3. Install rail extensions.
4. Remove breaker from cubicle.
5. Remove arc chutes (901, Fig. 3) and examine for burned, cracked or broken parts. To remove arc chutes, proceed as follows:
   a. Remove wing nuts from holding bar, remove bar and phase barriers.
   b. Lift arc chutes vertically to clear arc runners.
6. Wipe the contacts with a clean cloth saturated with a non-toxic cleaning fluid.
7. Replace badly burned or pitted contacts. See Contact Replacement, page 17, and Lubrication Instructions, pages 12 and 13.
8. Wipe all insulated parts with a clean cloth saturated with a non-toxic cleaning fluid.
9. Bearing pins and other sliding or rotating surfaces should be cleaned and then coated with a light film of grease. See Lubrication Chart page 13.
10. Turn racking crank to put racking clevis' in either test position (slot straight up and down) or connect position slot toward you. Do not attempt to manually charge springs with clevis' in disconnect position as shown in Figure 1.
11. Charge the breaker manually for maintenance closing (see Maintenance Closing below) to check latch and linkage movement.
12. Check breaker adjustments. See Adjustments, page 16.

LUBRICATION

Lubrication should be a part of the servicing procedure. Old grease should be removed from bearing pins and other non-current carrying rotating or sliding surfaces, and they should be wiped with a thin film of petroleum-oil-base precision-equipment grease, such as BEACON P-290.

Greasing should be done with care so as to avoid getting on insulating members, since it may affect the dielectric strength. Faces of main and arcing contacts should not be lubricated. The rubbing surfaces of the main contact fingers and hinge contact fingers are lubricated with coating of Siemens-Allis contact lubricant, 15-171-370-002. If dust has accumulated, disassembly is necessary to clean and relubricate these points. See Contact Replacement, page 17, and Lubrication Instructions, pages 12 and 13.

CIRCUIT BREAKER LUBRICATING INSTRUCTIONS

Periodic inspection of each circuit breaker is recommended at least once a year.

More frequent inspections are recommended, if severe load conditions, dust, moisture, or other unfavorable conditions exist.

Always inspect a breaker which has interrupted a heavy fault current.

During an inspection the breaker should be checked for proper operation, adjustment and lubrication. Adjustment procedures are described in the instruction book.

Recommended lubrication points are shown in adjacent chart.

The lubrication chart outlines two methods of lubrication. The first method requires no disassembly and is suggested for the prevention of problems which could be created by severe environmental or operating conditions.

The second method follows a vocedure similar to that performed on the breaker at the factory and should be used only in case of a general overhaul or disassembly.

METHOD FOR CLEANING BEARINGS ON OLDER STYLE BREAKERS HAVING NEEDLE OR SLEEVE BEARINGS

Needle bearings are factory lubricated for life and should not require attention. However, the best of greases are affected by time and atmospheric conditions and may require service.

Lubrication Chart

Lubrication Key	Part Description	Suggested Lubrication at Every * Operations or Every Six Months	Lubrication (Requires Disassembly) Recommended Every 5 Years or any Complete Overhaul
A	Contact arm hinge assembly. Primary disconnect fingers, grounding contact. Secondary disconnect fingers.	Wipe clean and apply a film of Siemens-Allis contact lubricant 15-171-360-002 in layer 1/32" to 1/16" thick.	
B	Sliding surfaces.	Light application of *Molycote 557*	Wipe clean and apply *Molycote 557* liberally.
C	Pivot pins, rotating parts such as drive pinion, gear.	Light application of *Molycote Penelube* 15-171-270-002.	Remove pins or bearings, clean per instructions and apply *Beacon P-290* 00-337-131-001.
D	Ground surfaces such as latches, rollers, props, etc.	Wipe clean and spray with *Molycote 557* 15-171-270-001.	Wash clean and spray with *Molycote 557* 15-171-270-001.
E	Arcing contacts.	Do not lubricate.	Do not lubricate.
F	Springs.	No lubrication required.	
G	Dry pivot points.	No lubrication required.	No lubrication required.

*Lubrication should be checked and renewed as follows:
LA-600 operations between lubrications 1750
LA-1600 operations between lubrications 500
LA-3000, LA-4000 operations between lubrications 250

To lubricate these bearings when parts are disassembled, the following procedure is recommended: Clean in solvent, wash in alcohol, spin in light machine oil, drain and repack with Beacon P-325 grease. *Caution: Needle bearings should not be removed from the retaining part.*

The sleeve bearings should be removed, washed in clean solvent, drained and dried thoroughly before lubricating with Beacon P-290.

MAINTENANCE CLOSING

During inspection prior to installation and for routine maintenance inspections the breaker contacts may be closed slowly to check clearances, contact adjustments, and movement of links and latches. A manual charging handle is used for maintenance closing the breaker.

Electrically operated breakers do not have a manual charging handle, but it is available as a maintenance item. Figure 5 shows the charging handle installed in an electrically operated breaker after removal of the front cover from the breaker. When the hole in the charging handle assembly is aligned with the holes in the operating mechanism frame, the pin which is attached to the cam is inserted. This pin holds the assembly in place and acts as a pivot point for the cam. After installation of the manual charging handle assembly on the electrically operated breaker, the actual maintenance closing operation is the same for both the electrically operated breaker and the manually operated breaker. Refer to Table 3 and Figure 5.

CAUTION The procedure in Table 3 should be used for maintenance closing only. Maintain a firm grip on the manual charging handle during the closing stroke — The breaker may suddenly latch fully closed and apply unexpected force to the charging handle.

Table 3 — Maintenance Closing (Refer to Figure 6)

CAUTION Turn racking crank to put racking clevis' in either test position (slot straight up and down) or connect position slot toward you. Do not attempt to manually charge springs with clevis' in disconnect position as shown in Figure 1.

Operation	Procedure
Closing Contacts	1. Pull charging handle DOWN ALL THE WAY (approximately 120°), and hold handle down.
	2. Place blade of screwdriver between hood and spring release latch and hold it in this position. This prevents springs from latching in charged position, or see note below.
	3. Slowly return handle to vertical position. Observe contact, touch, mechanical operation, etc.
	4. Remove screwdriver and pull charging handle to the fully charged position. Allow spring release latch to hold closing springs. Move charging handle to the vertical position.
	5. Close breaker normally by pressing close hood.
Opening Contacts	Push in manual trip rod.

NOTE Holding the spring release latch down prevents the stored-energy springs from propping in the charged position. Thus, when the handle is slowly returned to the normal vertical position, the energy in the springs is slowly released against the closing handle assembly cam face.

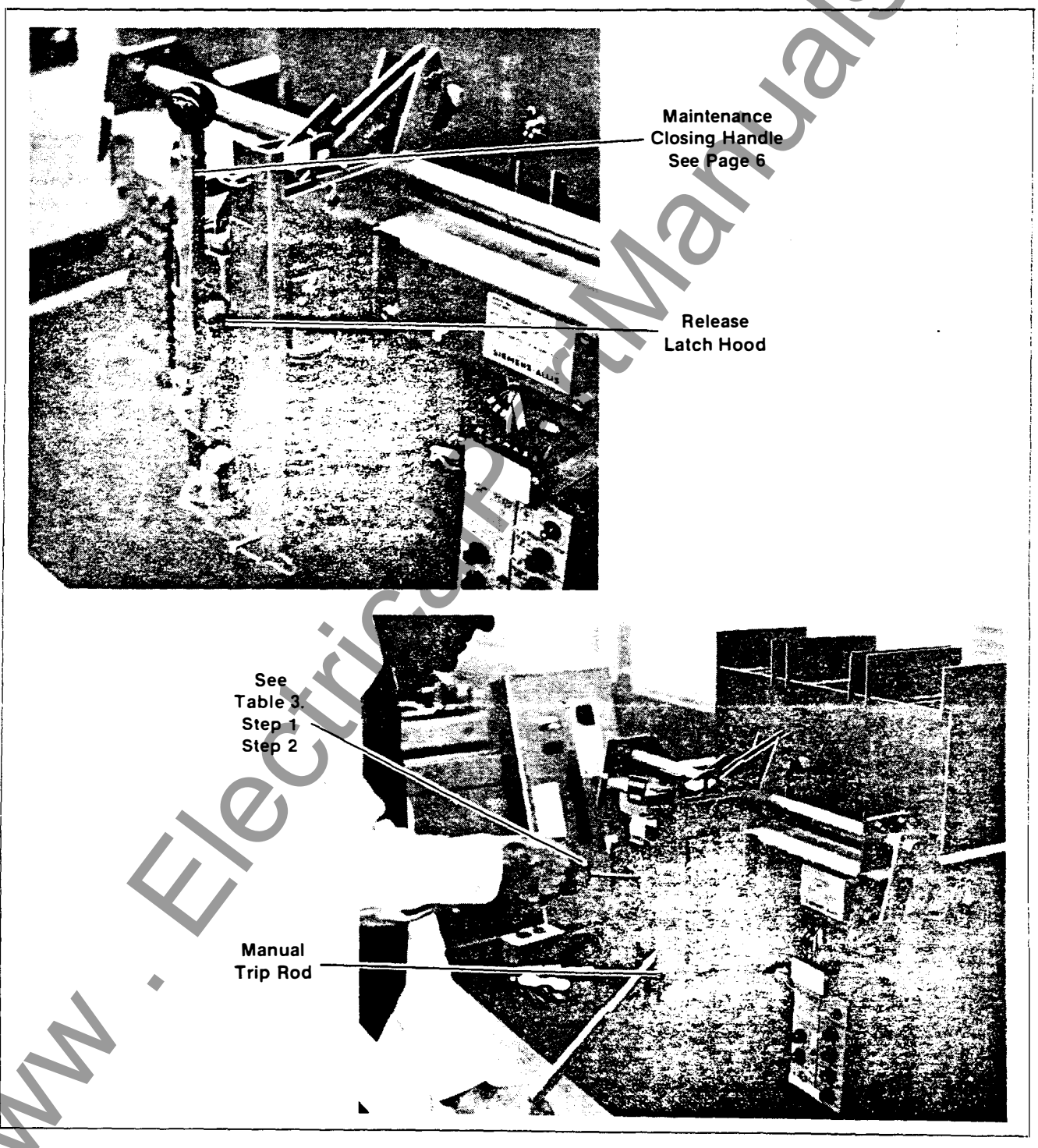


Figure 6. Maintenance Closing

ADJUSTMENTS

During maintenance inspections, the following items should be checked to ensure that the original settings are maintained:

TRIP LATCH ENGAGEMENT

(FIGURE 4)

Toggle latch (175) should engage the full width of trip latch (153A) when the breaker is closed in the normal manner. The tension on spring (155) can be increased if required by bending spring tab on trip flap towards the front of the breaker. Too much tension will interfere with the capability of the tripping actuator to move the trip flap, so over-bending should be avoided.

MAIN CONTACT MAKE

(FIGURE 7)

Compression of contact fingers (58) must be between .093 inches and .125 inches. This is the difference in the measurement from the breaker base to the tip of the finger contact surface when the breaker is open and the measurement in the same place when the breaker is closed. This is checked with a normal closing operation — not maintenance closing. Adjustment is provided by positioning screws (85) after loosening nuts (86). Counterclockwise rotation of screws (85) increases compression. Care should be taken to retighten nuts (86) after adjustment. If it is desired to check contact pressure, a push-type spring scale can be used to compress contact fingers (58), with breaker open. Contact pressure should be between 20 to 30 pounds on each finger.

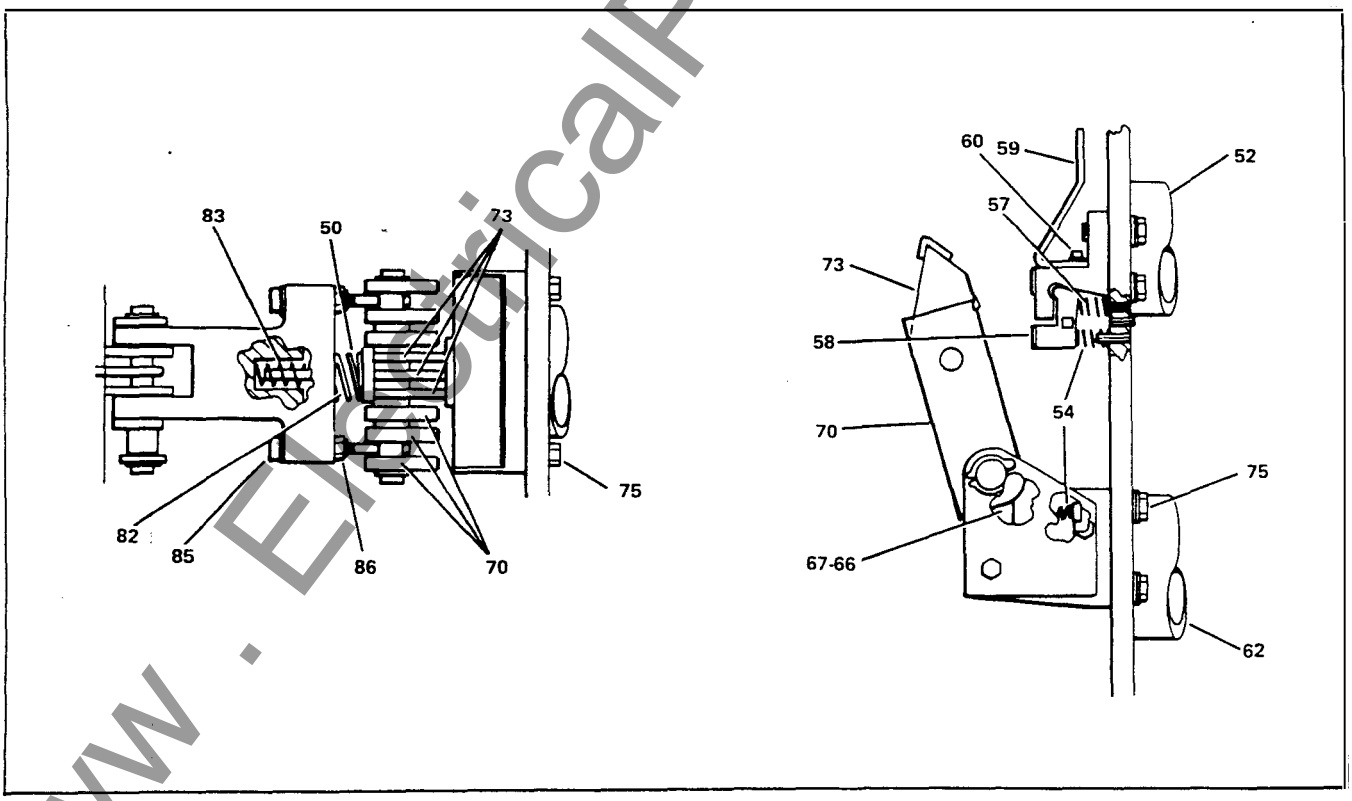


Figure 7. Contacts

ARCING CONTACT MAKE

(FIGURE 7)

With movable arcing contact (73) in any one phase touching the mating stationary contact when the breaker is closed by the maintenance closing method (See Table 3, Fig. 5), the phase-to-phase variation should not exceed .062 inches. Adjustment may be made by positioning screws (85) as in the previous paragraph, but it is essential that the main contact compression be maintained within the tolerance listed in the previous paragraph. Arcing contact pressure should be between 20 and 30 pounds when checked with a pull-type spring scale at the base of the arcing contact tip insert with the breaker contacts closed. Measure each blade separately.

CONTACT REPLACEMENT

(FIGURE 7)

The contact structure consists of main current carrying contacts and arcing contacts arranged so that initial contact make and final contact break is by means of the arcing contacts. The actual contact surfaces are clad with an alloy facing which greatly reduces mechanical wear and rc erosion.

When inspection of the alloy facing indicates that the contacts should be replaced, it should be noted that hinge contact fingers (66, 67) main contact fingers (70) and arcing contacts (73) are spring loaded. Therefore, care must be exercised in removal and installation of any of the contacts.

MAIN CONTACT FINGERS

(FIGURE 7)

With the breaker contacts open and the stored-energy springs discharged main contact fingers (58) may be removed by loosening screws (75) enough to relieve the compression on springs (54, 57). There are two springs behind each finger and it is important that they be positioned properly upon reinstallation. If difficulty is experienced in correctly positioning these springs, the upper and lower primary disconnects (902, Fig. 1) may be removed from each phase and the breaker inverted to rest on the ends of connectors (52) and (62).

STATIONARY ARCING CONTACT

(FIGURE 7)

The stationary arcing contact is part of connector (52) and may be replaced by proceeding as above. In this case, screws (60) must be removed.

HINGE CONTACT FINGERS

(FIGURE 7)

Hinge contact fingers can be replaced by removing lower connector and removing fingers individually.

MOVING ARCING AND MAIN CONTACT

(FIGURE 7)

Either moving arcing contact (73) or main contact (70) or both may be removed and replaced as follows:

Remove two screws on each side of lower connector. The complete movable contact assembly may now be brought to a bench. The location of spacers should be noted, in disassembly.

CAUTION Extreme care should be taken to hold the assembly firmly to retain spring guide (80) and spring (82, 83) upon removal of the screws.

The moving arcing contact or the main contact may now be easily replaced. The reverse procedure is followed for reinstallation. Care should be taken to replace spacers correctly. Check alignment and adjustment of contacts upon reassembly.

TRIPPING ACTUATOR

When the static trip device senses a circuit condition that requires the circuit breaker to open, it produces an output that is fed to the tripping actuator. This device then causes the circuit breaker contacts to open and isolate the circuit.

Mounted on the circuit breaker, the tripping actuator is held in a charged position by a permanent magnet. It contains a coil that is energized by the output of the static trip device. When energized, the coil causes the magnetic flux to shift to a new path, releasing the stored energy of a spring located inside the tripping actuator. The spring provides the energy to trip the breaker moving the trip flap clear of the toggle latch.

If the spring loaded armature does not reset during trip operation as explained above, spacer washers may be added to obtain positive reset of the armature.

If adding spacers does not allow the armature to be reset, the tripping actuator should be replaced (if breaker mechanism is not at fault).

NOTE Do not attempt to disassemble the tripping actuator as this may destroy the magnetic field set-up by the permanent magnet and will render the actuator latch inoperative until re-magnetized.

When replacing a tripping actuator, the coil leads must be connected to the terminal block of the static trip in the correct polarity relationship.

The black lead of coil must be connected to terminal 7 (negative) and the red lead of coil connected to terminal 8 (positive) of the static trip device.

When the tripping actuator has been replaced, the circuit breaker should be given a FUNCTION TEST to ensure proper operation of all components. Refer to Siemens-Allis Instruction Book 18X4827 for the procedures of the FUNCTION TEST.

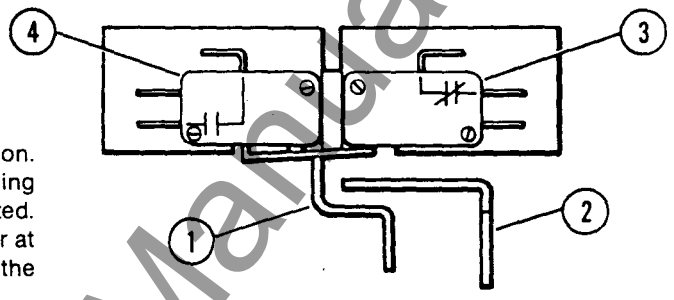
MOTOR CUTOFF SWITCHES

The function and adjustment of the motor cutoff switches on electrically operated breakers is described in Figure 8.

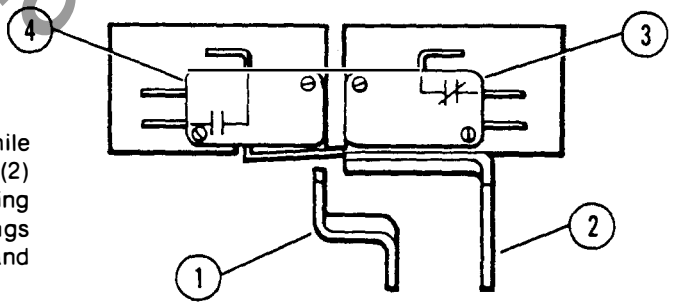
NOTE In position 3 there is clearance between both levers and the switch actuating leaf. Clearance may be minimal (approx. 1/64) or up to 1/16 inch. It is important to completely remove pressure from the switch actuating leaf to be sure that the switches are free to actuate. Adjustment is made by carefully bending the levers as indicated by arrows (Items 1 and 2). Do not bend the switch actuating leaf.

NOTE **CAUTION!!** If the motor cutoff switch (3) does not open, the motor will continue to run and the cam follower (233) will reengage wind and close cam (223, Fig. 2) jamming the entire mechanism, possibly stripping gears in the gear motor, blowing the control fuse, or damaging the motor. To free a jammed mechanism it is necessary to remove the gear motor.

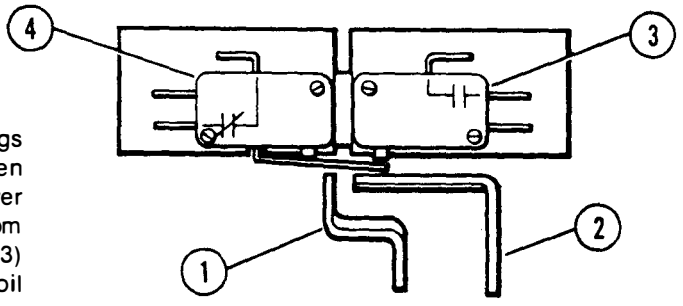
CAUTION!! The springs will discharge and the breaker close when the gear motor pinion is disengaged from the spur gear.



Position 1. Springs discharged; motor in stop position. Note that spring position lever (1) is forward actuating both switches. Motor/gear position (2) lever is retracted. Motor cutoff switch (3) is closed. Application of power at this time will cause the motor to start thereby charging the closing springs.



Position 2. Springs charging; motor not yet cutoff. While the springs are charging the motor/gear position lever (2) moves forward applying pressure to the switch actuating leaf. The spring position lever (1) retracts as the springs reach full charge. The motor cutoff switch (3) is closed and the motor is running.



Position 3. Springs charged; motor stopped. The springs have reached position. The motor/gear lever (2) has been retracted by roll pins on the large gear as the cam follower (233, Fig. 2) on the large spur gear has disengaged from the wind and close cam (223). The motor cutoff switch (3) has opened, stopping the motor, and the closing coil switch (4) has closed. Upon application of power to the closing circuit the breaker will close. Switches then return to No. 1 position. Refer to Notes 1 and 2.

Figure 8. Motor Cutoff Switches (Bottom View)

TRIPPING TRANSFORMERS — STATIC TRIP II

There are several tripping transformer ratings available, each with seven calibrated pickup settings (Page 12).

The tripping transformers are mounted on the lower connector and mounted with the polarity mark facing the breaker panel.

CURRENT SENSORS — LimiTrip

The current sensors provided with the optional LimiTrip device are integrated units containing two cores with four terminals. Proper polarity is established when the terminals face away from the panel. LimiTrip sensors should never be subjected to primary current with the LimiTrip device disconnected from the sensor.

SECONDARY DISCONNECT ASSEMBLY OPTION

The electrical attachments are wired to the terminals of a secondary disconnect assembly (see Figure 9), which is mounted on the left side of the breaker. Three blocks of ten terminals each can be mounted on the breaker. The secondary disconnect assembly is accessible from the front of the breaker and aligns with a stationary unit in the cubicle. The stationary contact strips should be lubricated with a light film of contact grease which is furnished with the switchgear.

AUXILIARY SWITCH OPTION

The auxiliary switch (see Figure 10) is of the rotary type and functions by direct connect to the breaker mechanism. The contacts are factory set for "a" (open when the breaker is open) and "b" (closed when the breaker is open) position, but each rotor (955) may be adjusted individually in steps of 30 degrees. This adjustment is made by removing cover (962) and lifting the entire rotor assembly out of case (950) after disconnecting arm (957) from the linkage. Cotter pin and bearing (956) are removed to permit removal of rotors (955) from shaft (954). To change rotors (955) from "a" to "b" position, the rotor should be rotated 60° in the clockwise direction after removal and replaced on the shaft in this new position.

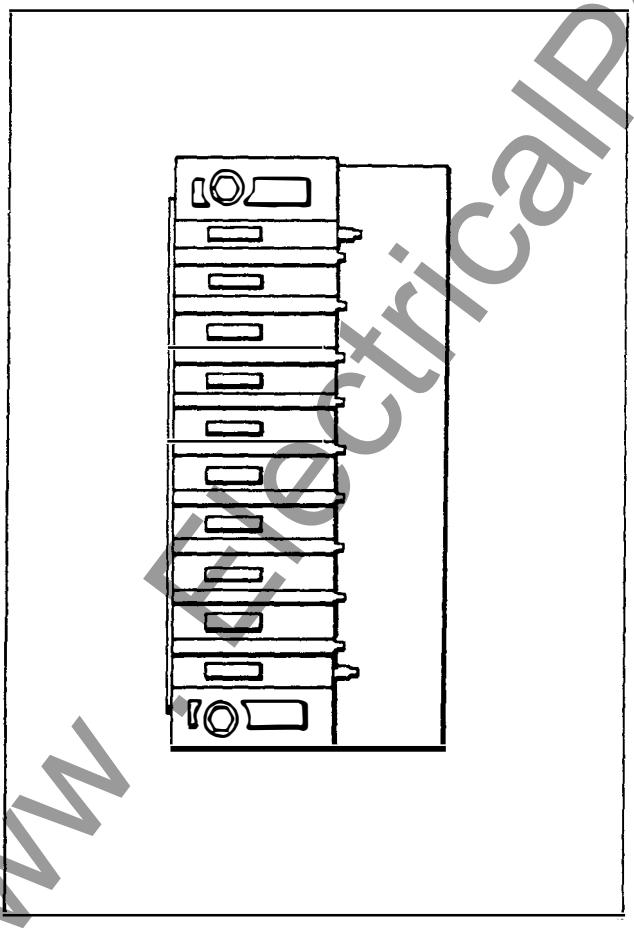


Figure 9. Secondary Disconnect Assembly

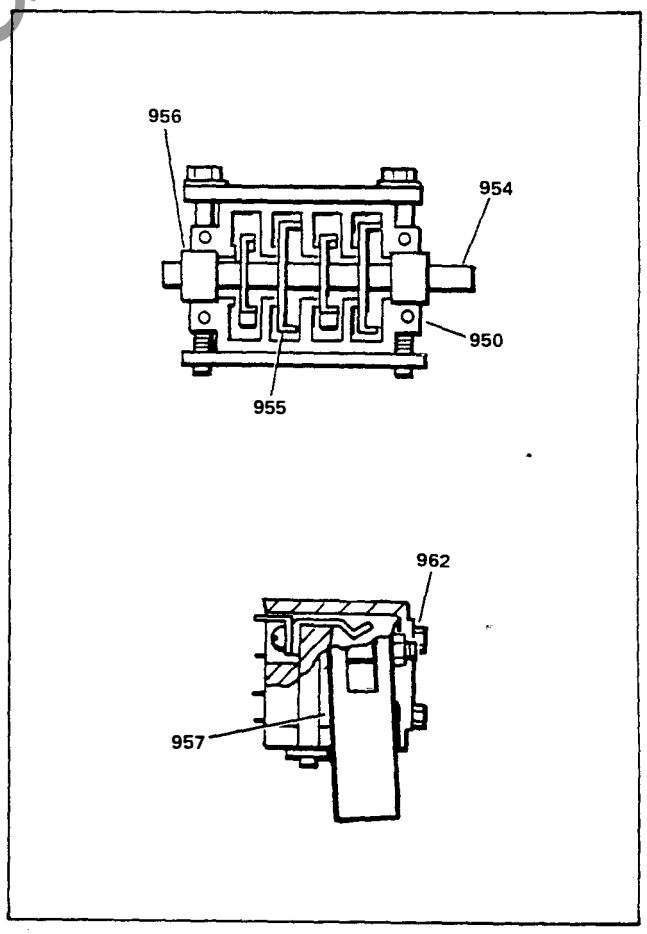


Figure 10. Auxiliary Switch

SHUNT TRIP OPTION

Each electrically operated breaker is equipped with a shunt trip attachment for tripping from a remote location. (See Figure 11.) Since the shunt trip coil is designed for a momentary duty cycle, an "a" auxiliary contact switch is used to interrupt its circuit immediately after the breaker is tripped. Energization of the coil causes the armature to pick up and rotate the trip latch to trip the breaker. A compression spring (808) returns the armature to its normal position.

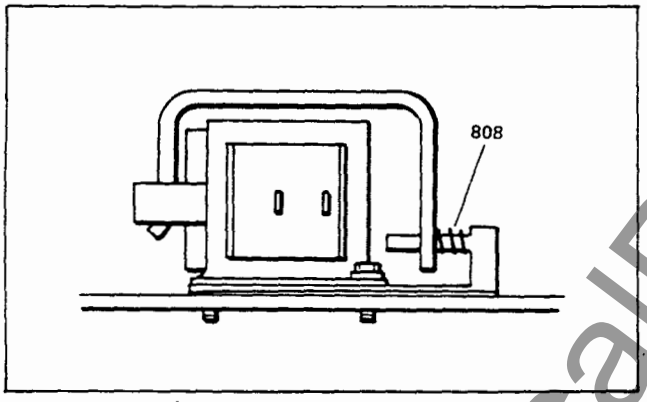


Figure 11. Shunt Trip

UNDERVOLTAGE TRIP DEVICE OPTION

The undervoltage trip device (Fig. 12) automatically trips the breaker on loss of voltage. Either instantaneous or time-delay operation can be supplied. A .06 inches gap should be maintained between flap extension and pull link (738) when the device is energized with the breaker closed. Pick-up and drop-out is set so that the device picks up at a voltage of 85% or less of rated value and drops out between 30% and 60% of the rated value.

NOTE Pick-up and drop-out are not individually adjustable.

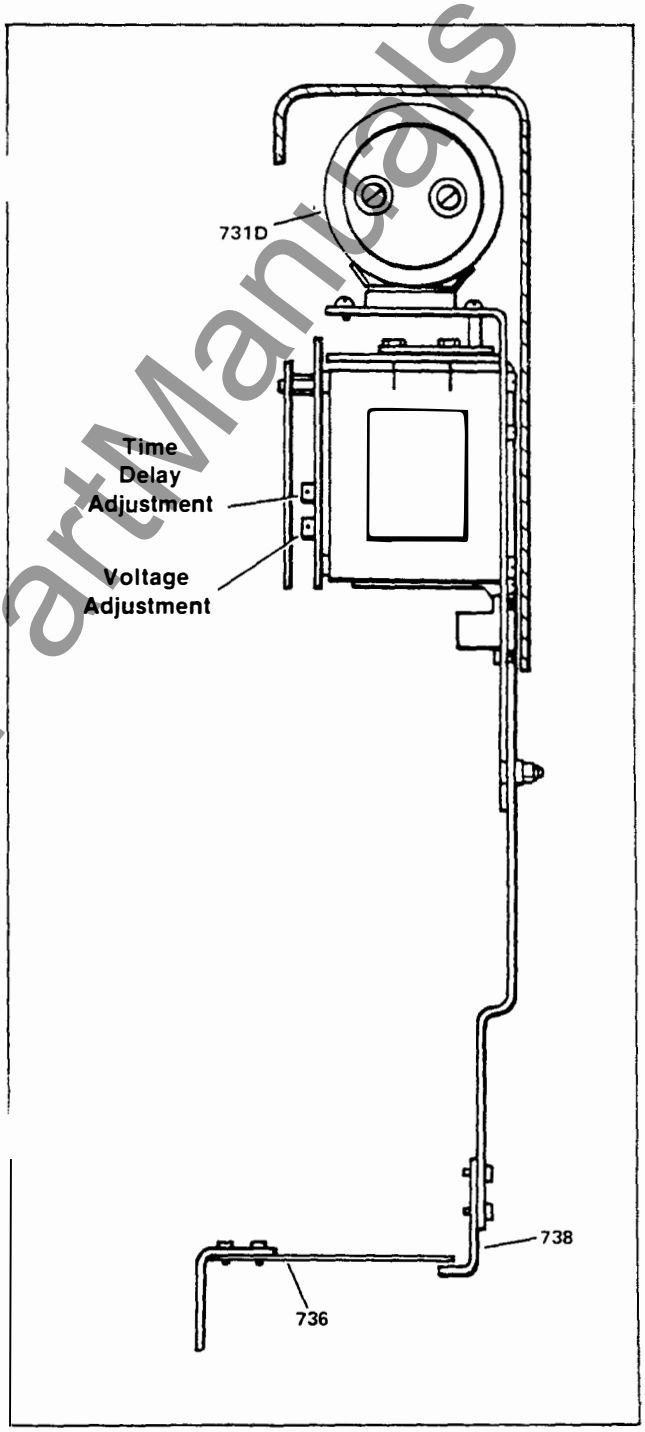


Figure 12. Undervoltage Trip With or Without Time Delay

BELL ALARM SWITCH OPTION

The bell alarm switch option (see Figure 13) functions to operate a switch. A single pole double throw or a double pole double throw switch is available. The switch operator is connected to and is operated by the tripping actuator. The switch operator remains tripped even when the actuator is reset by the breaker. The switch operator must be reset either manually, or by an additional optional electrical reset solenoid.

The contacts of the bell alarm switch can be connected in series with the breaker closing coil, to provide a lockout feature to prevent reclosing after a fault

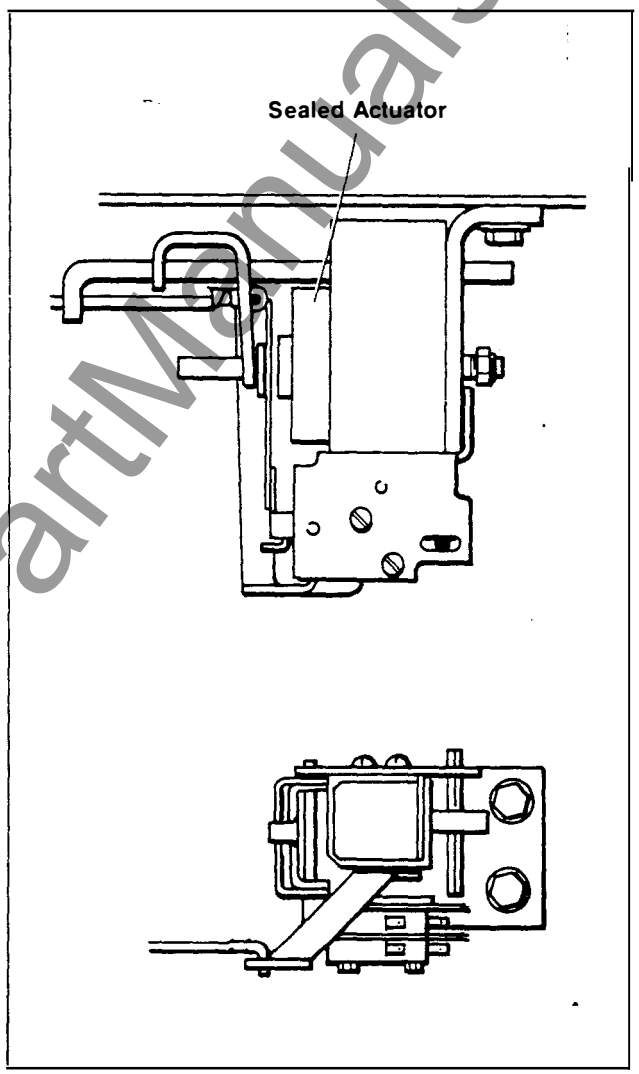


Figure 13. Bell Alarm

STATIC TRIP OPTION

The optional tripping devices are covered in detail under their own instruction books which are referenced on the last page. Several types are available that provide a range of tripping functions.

The Static Trip II device mounts onto a slide type bracket on the circuit breaker. To remove trip device, the terminal block cover located above the trip device should be removed, exposing the terminal block screws. The lower row of screws can be loosened with a screwdriver, allowing the terminal block fanning strip from the static trip to be removed from the terminal block. Removal of the fanning strip exposes a mounting screw. This screw can be removed allowing the static trip device to be removed from the breaker by pulling the trip device towards the front of the breaker.

Table 4. Trip Rating Table — Amperes
Static Trip II

Breaker Type and Frame Size	Tripping XFMR Rating (Primary)	Long Time Element Calibrated Pick-Up Settings							Max. Cont. Rating	Ground Element Calibrated Pick-Up Settings			
		A	B	C	D	E	F	G		15%	25%	50%	100%
LA-3200A	2000 Amps	1000	1250	1500	1750	2000	2250	2500	2500	300	500	1000	2000
LA-3200A	3200 Amps	1600	2000	2400	2800	3200	3600	4000	3200	480	800	1600	3200
LA-4000A & B	4000 Amps	2000	2500	3000	3500	4000	4500	5000	4000	600	1000	2000	4000

Table 5. Trip Ratings — Amperes
LimiTrip

Breaker Type and Frame Size	Tripping XFMR Rating (Primary)	Long Time Element Calibrated Pick-Up Settings						Max. Cont. Rating
		A	B	C	D	E	F	
LA-3200A	2000 Amps	1000	1250	1500	1750	2000	2250	2250
LA-3200A	3200 Amps	1600	2000	2400	2800	3200	3600	3200
LA-4000A & B	4000 Amps	2000	2500	3000	3500	4000	4500	4000

PARTS

HOW TO USE YOUR RENEWAL PARTS ORDERING GUIDE

1. Locate the part or parts to be replaced in one of the drawings in this manual.
2. Identify each part by item number, description and part number. Give drawing figure number in which part is shown.
3. Include breaker type, rating and breaker serial number with your order.
4. Place order with your Siemens-Allis representative.
5. When ordering relays or other electrical parts, include control voltage (see recommended spare parts list for part numbers).

ORDERING EXAMPLE

Type LA-3200 Rated Amps 3200 Serial Number S-86679A-4

Mode of Operation: ☐ Electrical ☐ Manual ☒ E.O./M.O.

Parts Ordering Guide: SG-3038

Fig.	Item	Description	Part Number	Quantity
1	6	Barrier	71-142-324-001	1
3	24	Spring	71-141-666-001	1
2	28	Base	71-340-240-001	1

IF REQUIRED PART IS NOT IDENTIFIED IN THIS MANUAL —

1. Make a copy of the drawing figure in which the part would appear.
2. Indicate with arrows or other markings location of part.
3. Describe or sketch required part.
4. Include breaker type, rating and breaker serial number with your order.
5. Place order with your Siemens-Allis representative.

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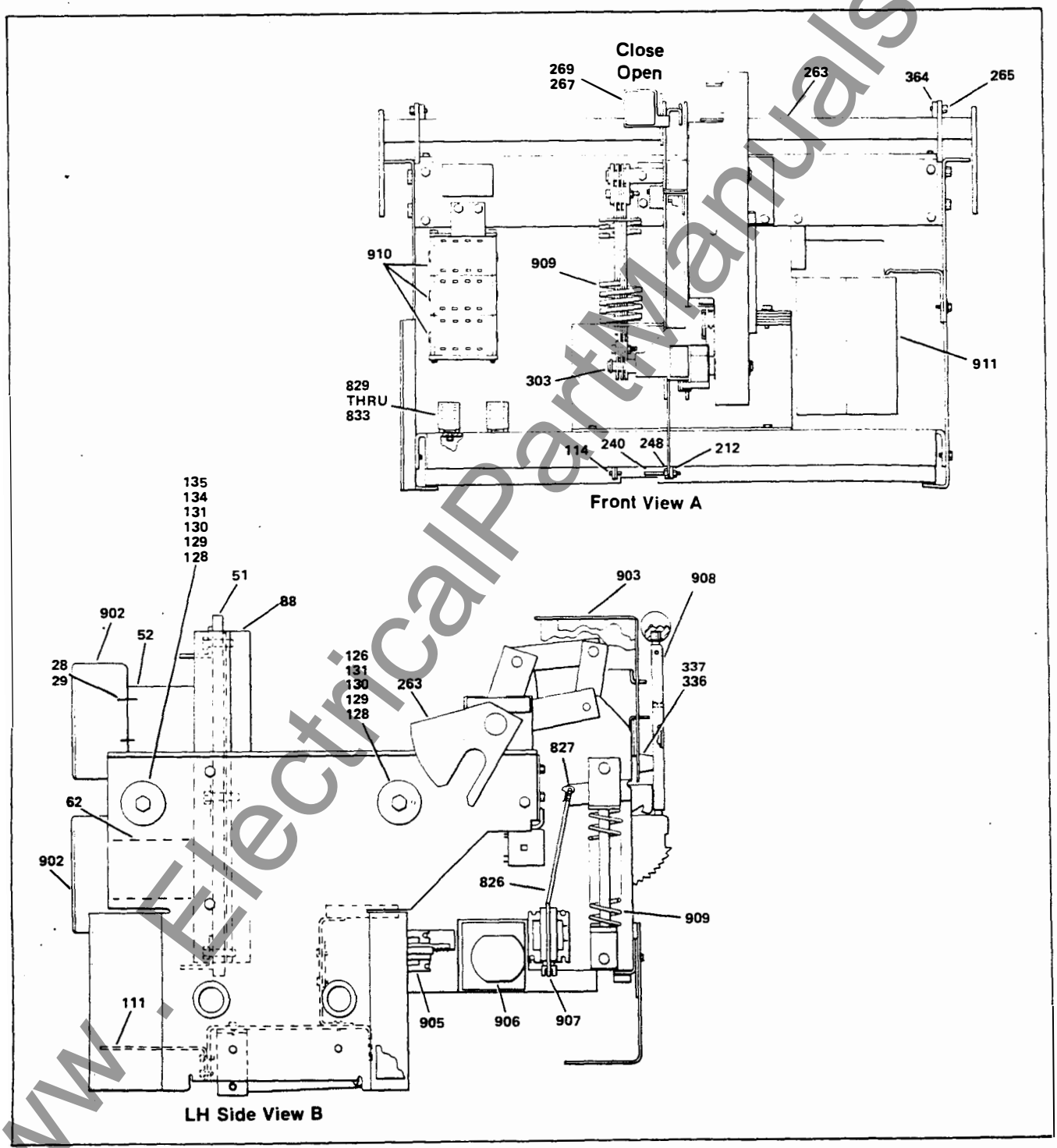

Figure 1. Circuit Breaker

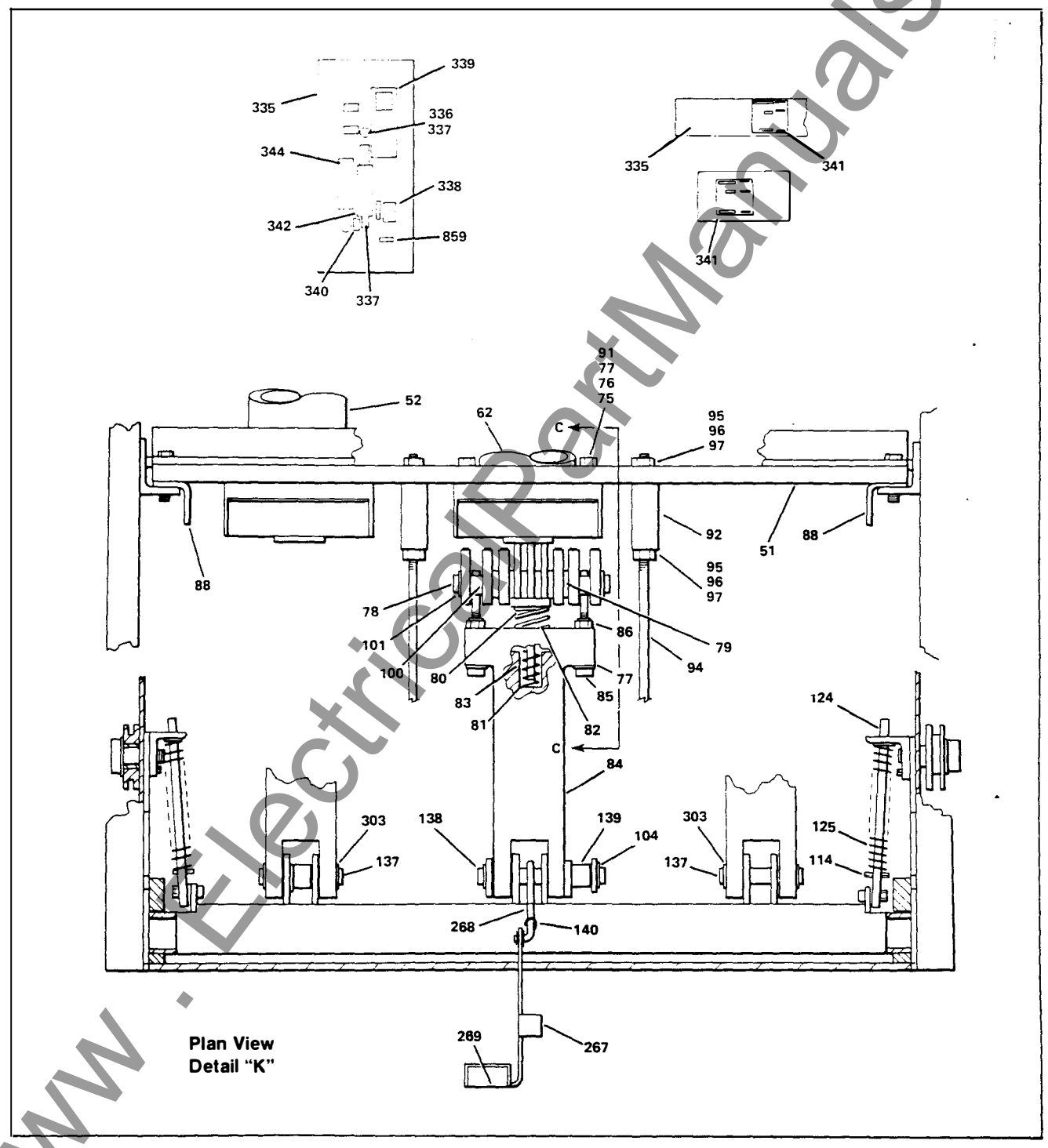

Figure 1. Circuit Breaker (Continued)

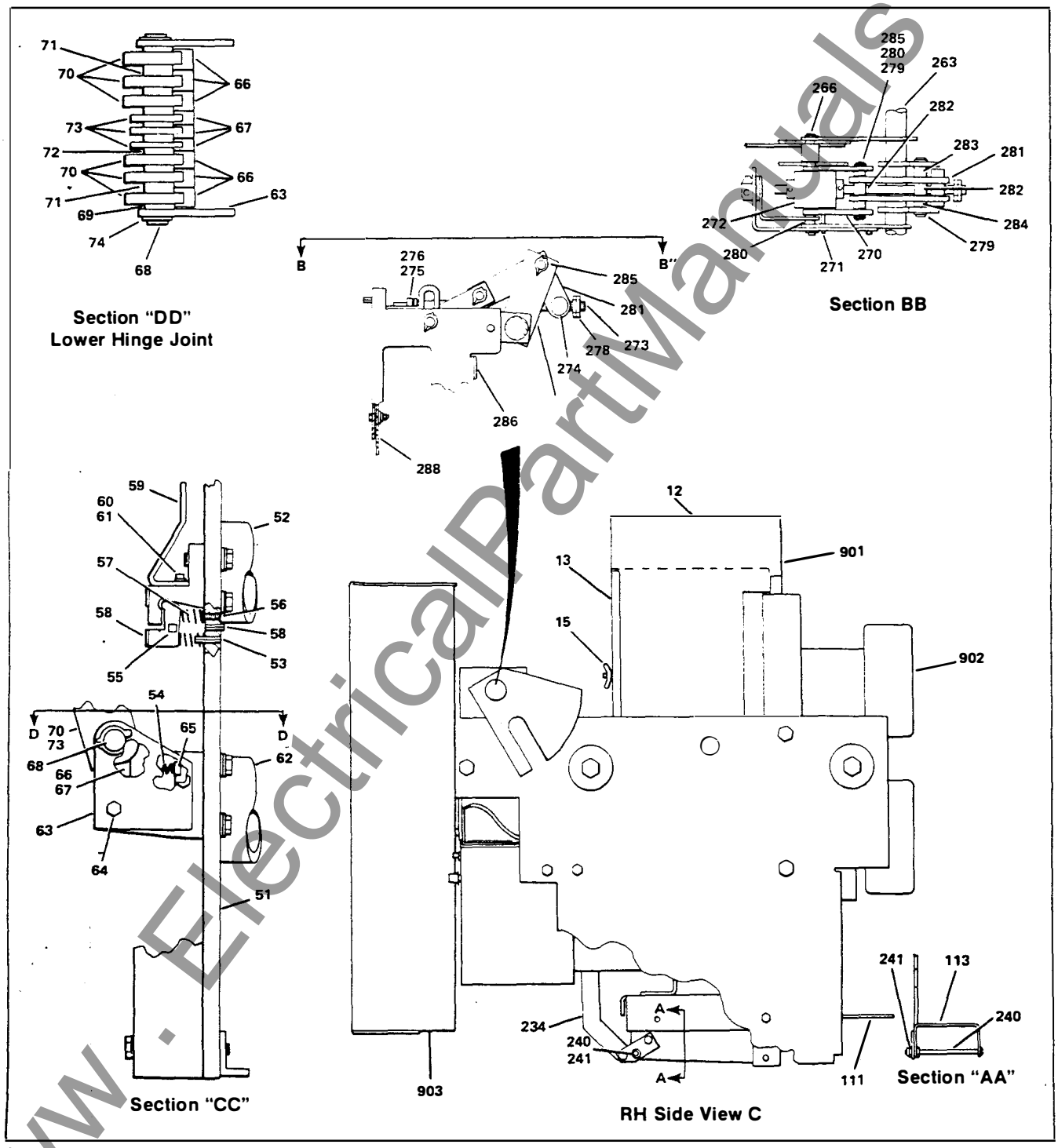

Figure 1. Circuit Breaker (Continued)

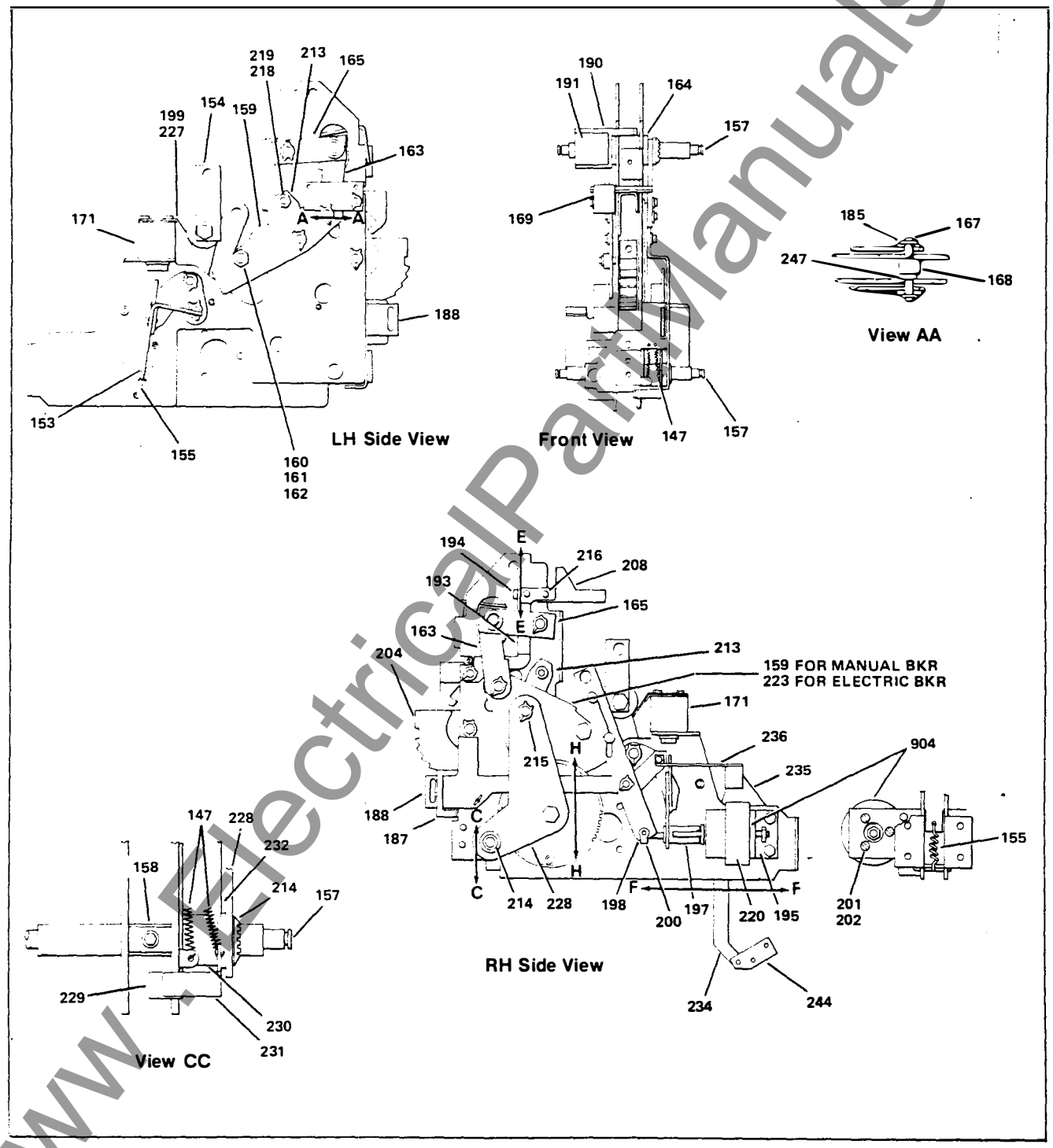

Figure 2. Operator Assembly

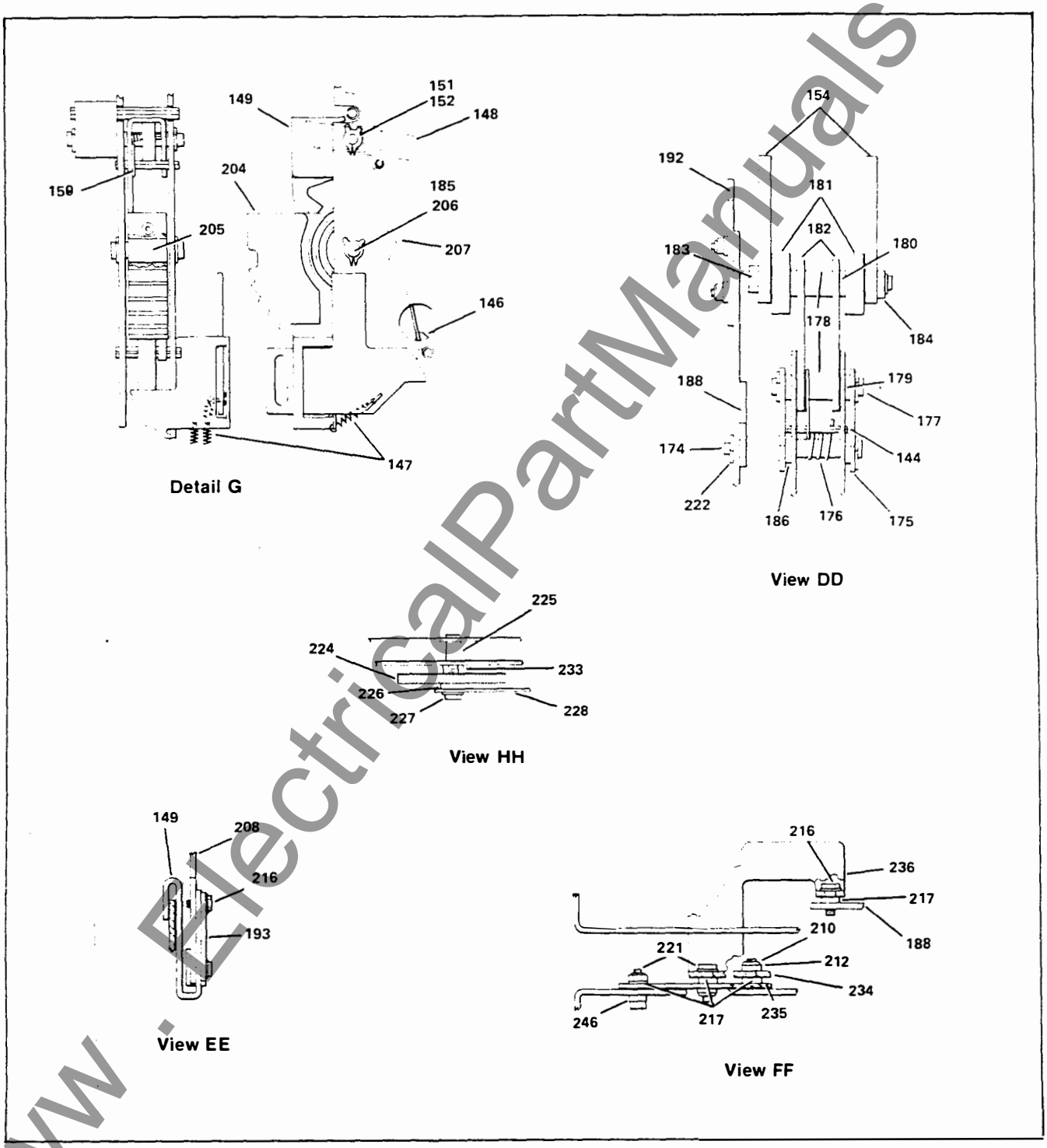

Figure 2. Operator Assembly (Continued)

Item	Description	Part Number
12	Phase Barrier	18-727-829-001
13	Strap	18-727-834-001
15	Wingnut, .250-20	15-639-101-002
28	Screw, Hex. Soc. Button Hd., .250-20 x .62	15-615-024-001
*28	Screw, Hex. Washer Hd. Thd. Rolling, .25-20 x .62	00-615-663-373
29	Lockwasher, Int. T.. .250	00-655-047-140
51	Panel	18-393-688-001
*51	Panel	18-395-371-001
52	Contact Assy., Upper	18-727-735-502
*52	Contact Assy., Upper	18-729-735-502
53	Roll Pin, .168 x .75	00-671-177-313
54	Spring	71-141-976-001
55	Roll Pin, .188 x 1.50	00-671-177-321
56	Rivet, Rd. Hd., .188 x .375	00-671-251-085
57	Spring	71-141-173-001
58	Contact Assy.	18-727-833-501
59	Arc Runner	18-727-730-001
*59	Arc Runner	18-657-840-384
60	Screw	00-613-124-216
61	Lockwasher, #10	00-655-017-022
62	Contact Assy., Lower	18-727-733-502
*62	Contact Assy., Lower	18-729-734-502
63	Support, Pivot	18-657-940-150
64	Screw, Hex. Washer, Hd., Thd. Rolling, .25-20 x .62	00-615-663-373
65	Seat, Spring	18-657-822-171
*65	Seat, Spring	18-657-854-166
66	Contact	18-727-825-002
67	Contact	18-727-825-001
68	Pin	18-727-750-002
*68	Pin	18-727-750-003
69	Washer, Plain	00-651-027-357
*69	Spacer	18-727-750-003
70	Contact Assy., Main	18-727-729-501
*70	Contact Assy., Main	18-727-729-501
71	Spacer, .62 I.D. x .310	18-727-839-003
72	Spacer, .62 I.D. x .180	18-727-659-002
73	Contact Assy., Arcing	18-727-729-502
74	"X" Washer	15-171-399-035
75	Capscrew, Hex. Hd., .312-18UNC-2A x 1.00	00-611-315-422
*75	Capscrew, Hex. Hd., .312-18UNC-2A x 1.5	00-611-315-426
76	Lockwasher, Med., .312	00-655-017-030
77	Washer, Plain	00-651-027-170
78	Pin	18-657-822-354
*78	Pin	18-657-840-385
79	Spacer, .50 I.D. x .180	18-727-838-001
80	Seat, Spring	18-657-822-184
81	Seat, Spring	18-657-822-196
82	Spring	18-657-823-358

*Applies to LA4000B only.

Item	Description	Part Number
83	Spring	71-141-799-001
84	Pushrod	18-393-685-001
85	Capscrew, Hex. Soc. Hd., .312-18 x 3.00 (Special)	18-657-822-347
86	Locknut, Hex., .312-18, Stover	15-171-063-006
*86	Locknut, Hex., .312-18, (Huglock)	00-633-222-105
88	Angle, Glastic	18-657-822-358
*88	Angle, Glastic	18-657-870-193
89	Angle, L.H.	18-657-822-182
90	Angle, R.H.	18-657-822-181
91	Capscrew, Hex. Hd., .312-18UNC-2A x 1.25	00-611-315-424
*91	Capscrew, Hex. Hd., .312-18UNC-2A x 1.75	00-611-315-472
92	Brace	18-657-822-359
94	Stud	14-135-915-008
95	Washer, Plain	00-651-017-135
96	Lockwasher, Ext. T., .250	00-655-067-140
97	Nut, Hex. Jam, .250-20	00-631-171-104
100	Washer	71-152-809-024
101	"X" Washer	00-659-055-250
104	"U" Washer	00-659-056-057
111	Ground Bar	18-657-781-278
113	Channel	18-727-844-001
114	Roll Pin, .188 x .75	00-671-177-313
124	Spring Guide	18-657-838-281
125	Spring, Opening	71-142-123-001
126	Washer, .38	00-651-007-214
128	Wheel	18-657-822-355
129	Bearing, .50 I.D. x 1.0	15-171-399-033
130	Washer, .50	00-651-007-285
131	Capscrew, Hex. Hd., .500-13 x 2.0	00-611-315-552
134	Nut, Hex., .500-13	00-631-171-108
135	Lockwasher, .50	00-655-017-036
137	Pin, .50 Dia. x 2.04	18-727-832-001
138	Pin, .50 Dia. x 3.00	18-727-832-002
139	Spacer, .50 I.D. x .460	18-727-838-002
144	Roll Pin, .125 x 1.25	00-671-176-195
146	Pawl	18-657-800-346
147	Spring	00-837-455-026
148	Latch Assy.	18-657-765-564
149	Hood	18-657-882-559
150	Spring	71-142-408-001
151	Pin, .31 x 2.12	18-657-769-367
152	"X" Washer	00-659-055-187
153	Trip Flap Assy.	18-727-727-502
155	Spring	72-140-324-001
157	Spring Hanger	18-727-726-001
158	Clip	18-657-768-014
159	Closing Cam	18-724-493-001
160	Capscrew, Hex. Hd., .375-16 x 2.50	00-611-315-479

*Applies to LA4000B only.

Item	Description	Part Number
161	Locknut, Stover, .375-16	15-171-063-011
*161	Locknut, Elastic, .375-16	00-633-025-124
162	Spacer	18-657-768-053
163	Link	71-142-071-001
*163	Link	18-657-854-170
164	Bumper	71-142-102-001
*164	Bumper	18-657-854-169
165	Guide Link	18-657-768-024
*165	Guide Link	18-657-854-171
167	Pin, .375 x 2.12	18-724-501-006
168	Bearing, Needle, .375 x .875 x .562	00-813-109-037
169	Close Lever	18-657-768-020
171	Stop Block	18-657-768-039
174	Pin, Shoulder	18-657-769-368
175	Latch	71-142-070-001
176	Spring	18-657-768-033
177	Pin, .375 x 1.62	18-724-501-002
178	Spacer, .375 x .460	18-724-503-001
179	Spacer, .375 x .255	18-657-823-356
180	Spacer, .375 x .190	18-724-503-003
181	Roller	71-141-789-003
182	Toggle Link	18-657-768-025
183	Capscrew, Special, .375-24 x 2.44	18-657-822-333
184	Locknut, Stover, .375-24	15-171-063-014
185	"X" Washer	00-659-055-250
186	Washer, .375 x .12	18-657-768-374
187	Bracket Assy.	18-726-894-501
188	Trip Bar	18-728-500-037
190	Flag, Discharge	18-724-498-001
191	Decal, Charge Discharge	18-657-800-116
192	Lever, Slide	18-657-822-167
193	Interlock	18-657-823-355
194	Interlock Guide	18-657-823-354
195	Bracket, Actuator	18-657-768-022
197	Reset Assy.	18-657-633-575
198	Reset Lever	18-657-822-166
199	Kick-Off Spring	18-657-768-038
200	Rod End Clip, .250	15-171-399-004
201	Screw, #10-32 x .62	00-615-513-220
202	Lockwasher, #10, Ext. Tooth	00-655-067-100
203	Washer, Rubber	72-140-000-001
204	Charge Cam	72-240-009-001
205	Bearing	15-171-399-030
206	Pin, .375 x 1.16	18-724-501-001
207	Spring	71-141-761-001
208	Cam, Spring Dump	18-657-838-288
210	Screw, Fl. Hd. #10-32 x .62	00-615-345-220
212	Nut, Elastic Stop, #10-32	00-633-050-210

*Applies to LA4000B only.

Item	Description	Part Number
213	Spacer, Link	18-657-763-372
214	Retainer	00-673-285-063
215	Pin, .375 x 1.88	18-724-501-004
216	Screw, #10-32 x .50	15-171-399-010
217	Guide	18-657-803-018
218	Capscrew, .312-18 x 1.75	00-615-113-428
219	Locknut, Stover, .312-18	15-171-063-006
220	Shield	18-657-784-013
221	Screw, #10-32 x .75	15-171-399-025
222	"X" Washer	00-659-005-156
223	Cam, Wind & Close	18-724-492-001
224	Gear Assy.	18-724-505-501
225	Gear Pin	18-657-768-371
226	Spacer, .62 x .240	18-727-839-005
227	Back-Up Spring	18-657-765-130
228	Gear Brace	18-724-508-001
229	Switch Lever (Cam)	18-657-768-037
230	Bearing	18-657-768-031
231	Switch Lever (Gear)	18-657-768-032
233	Cam Follower	18-657-768-026
234	Link	18-657-838-283
236	Extension	18-657-838-285
240	Screw, #10-32 x 3.25	00-615-485-242
241	Nut, Elastic Stop, #10-24	00-633-039-110
244	Link	18-657-854-124
246	Guide	18-657-854-166
247	Spacer	71-915-695-013
248	Nut, Hex, #10-32	00-631-109-210
263	Racking Shaft Assy.	18-727-744-501
*263	Racking Shaft Assy.	18-729-236-501
264	Retainer	18-657-822-197
265	Screw, Hex. Washer Hd., Thd. Rolling, .25-20 x .62	00-615-663-373
266	Pin, .375 x 3.75	18-724-501-011
267	Flag, Close	18-728-500-505
269	Decal, Close-Open	71-141-817-001
270	Link	18-657-823-340
271	Rivet, Flat Hd., .188 x .75	18-657-824-128
272	Rocking Block	18-657-823-359
273	Racking Screw Assy.	18-727-842-502
274	Barrel Nut	18-657-823-346
275	Collar	72-140-028-002
276	Roll Pin	00-671-185-901
278	Nut, Hex, .500-13	00-631-171-108
279	Pin, .375 x 1.94	18-724-501-012
280	Spacer, .375 x .310	18-724-503-004
281	"L" Link	18-657-823-341
282	Spacer, .375 x .50	18-724-503-004
283	Spacer, .375 x .460	18-724-503-001

*Applies to LA4000B only.

Item	Description	Part Number
284	Spacer, .375 x .190	18-724-503-003
285	"X" Washer	00-659-055-250
286	Bracket, Interlock	18-727-822-001
288	Slide Assy.	18-727-836-501
303	"X" Washer	15-171-399-035
309	Washer, Fibre	71-105-182-016
*309	Washer, Fibre	71-105-182-017
310	Support	71-142-108-001
312	Bracket	18-727-742-001
313	Terminal Block, 7 Point	15-171-051-005
314	Screw, Stand-Off	18-657-465-036
315	Screw, Terminal	18-657-465-035
316	Lockwasher, #6	00-655-047-060
317	Cover	18-657-822-165
318	Marking Strip	15-171-052-004
319	Capacitor	15-171-029-013
320	Terminal	00-851-062-023
325	Label	18-657-822-350
328	Insulation (Actuator Leads)	00-413-615-182
335	Cover	18-393-691-001
336	Bumper	15-171-399-007
337	Screw	15-171-399-010
338	Trip	18-657-838-287
339	Racking	18-657-784-002
340	Motor	18-657-784-003
341	Rack Position	18-657-823-348
342	Cover EO Only	18-657-803-006
344	Name Plate	18-657-823-345
859		See 18-723-588-801-802
901	Arc Chute	18-398-789-501
*901	Arc Chute	18-398-789-502
902	Primary Disc	18-733-481-501
*902	Primary Disc	18-733-481-502
903	Cover Assem. E.O. Trip Guard Must	18-655-008-547
	M.O. Be Added	18-655-008-548
904	Sealed Actuator	18-387-921-503
905	Shunt Trip	See Page 36
906	Motor Application	See Page 37
907	Closing Solenoid	See Page 38
908	Handle Assem. M.O.	18-656-781-895
909	Spring Assem.	18-726-870-501
910	Aux. Switch	See Page 42
911	Static Trip	See Page 43

*Applies to LA4000B only.

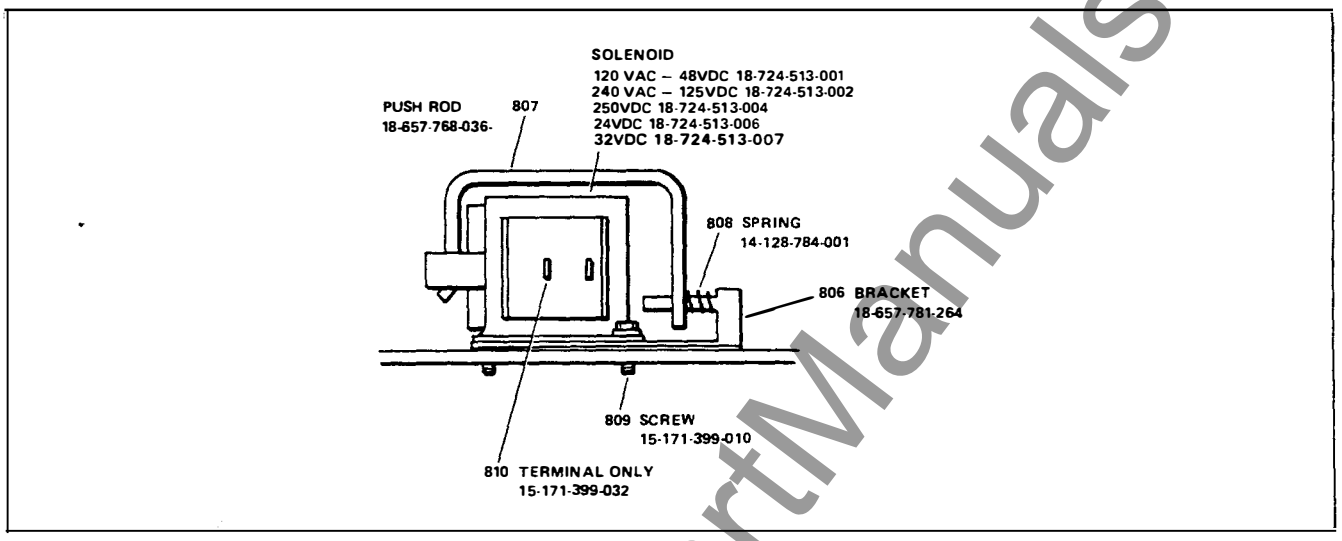

Figure 3. Shunt Trip

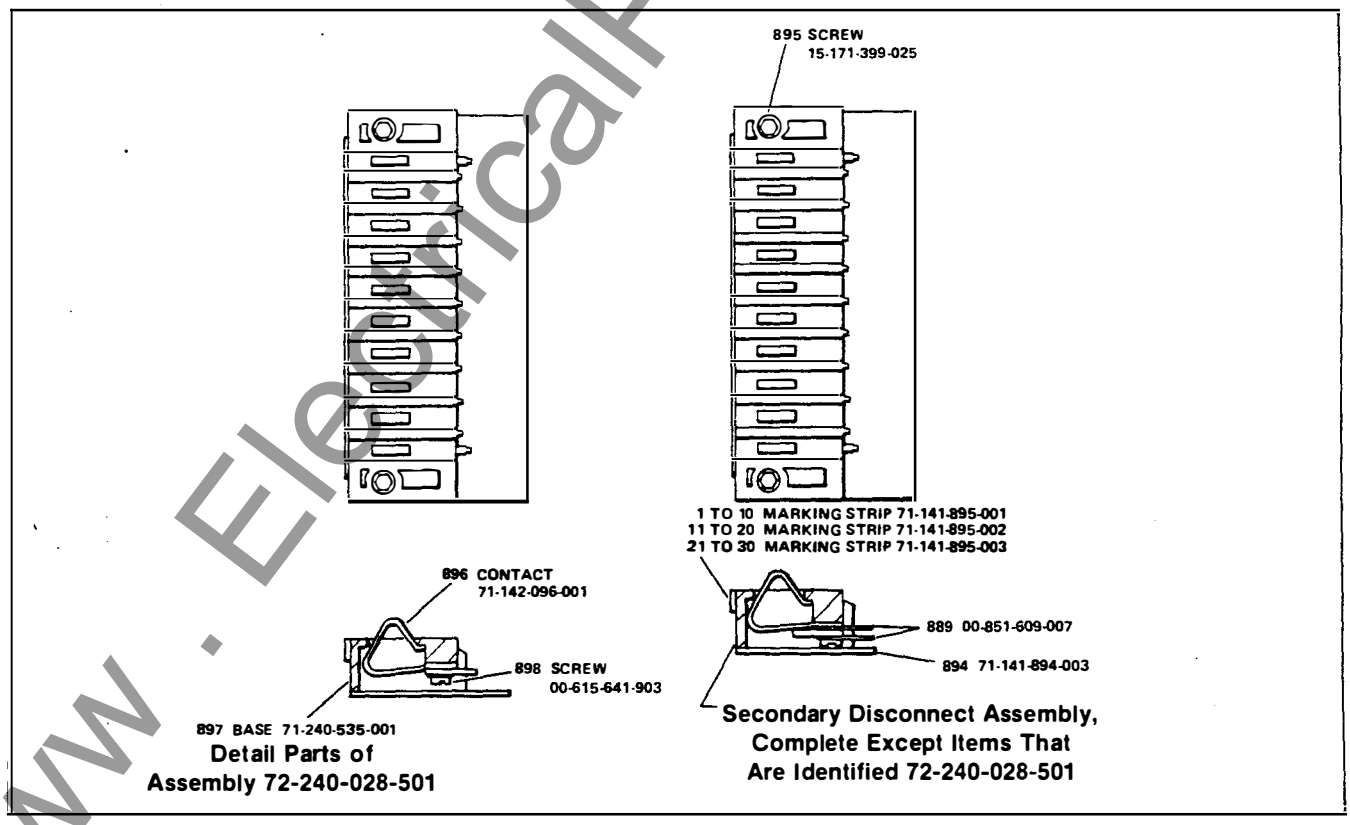

Figure 4. Secondary Disconnect Assembly

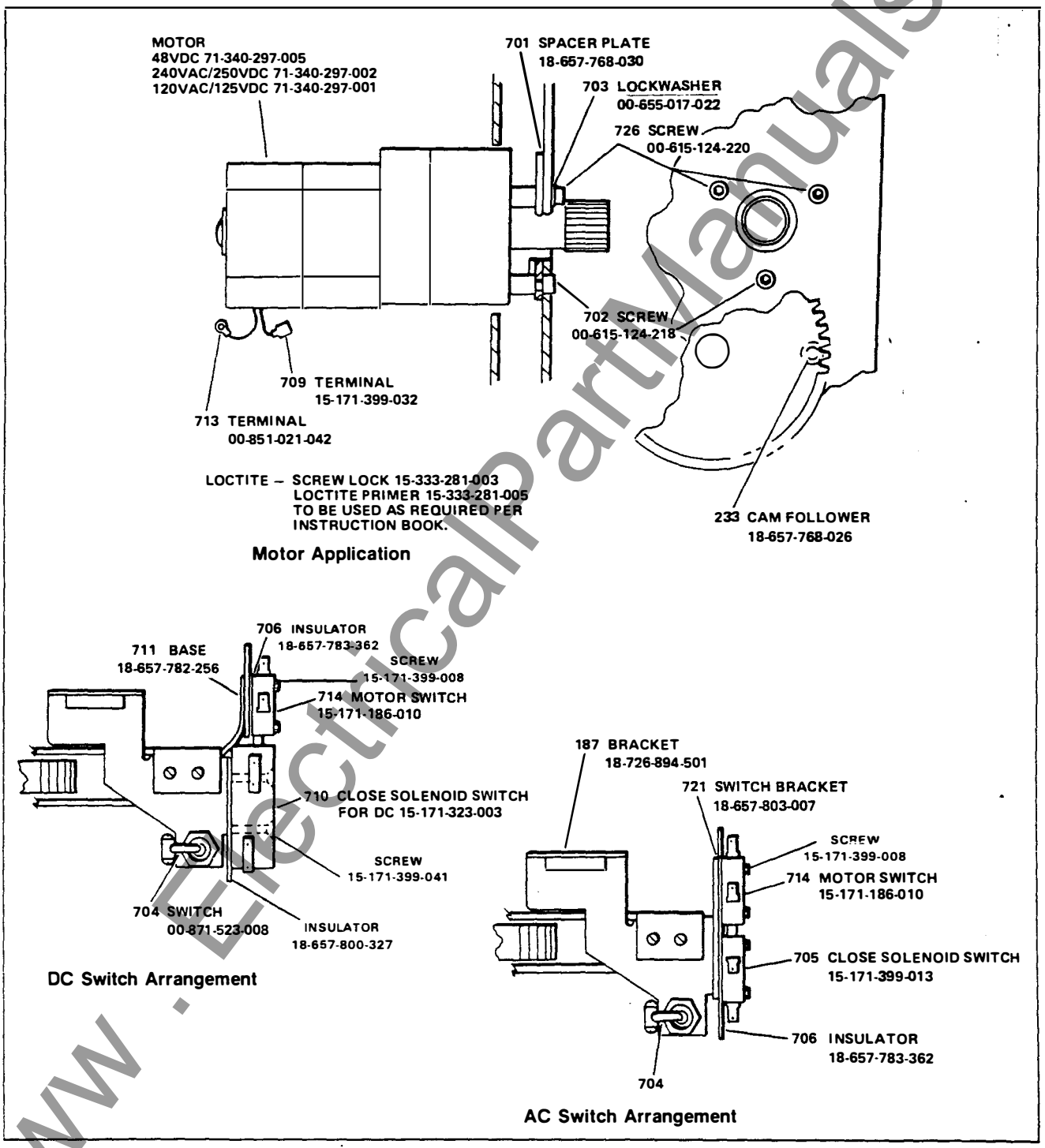

Figure 5. Motor Group

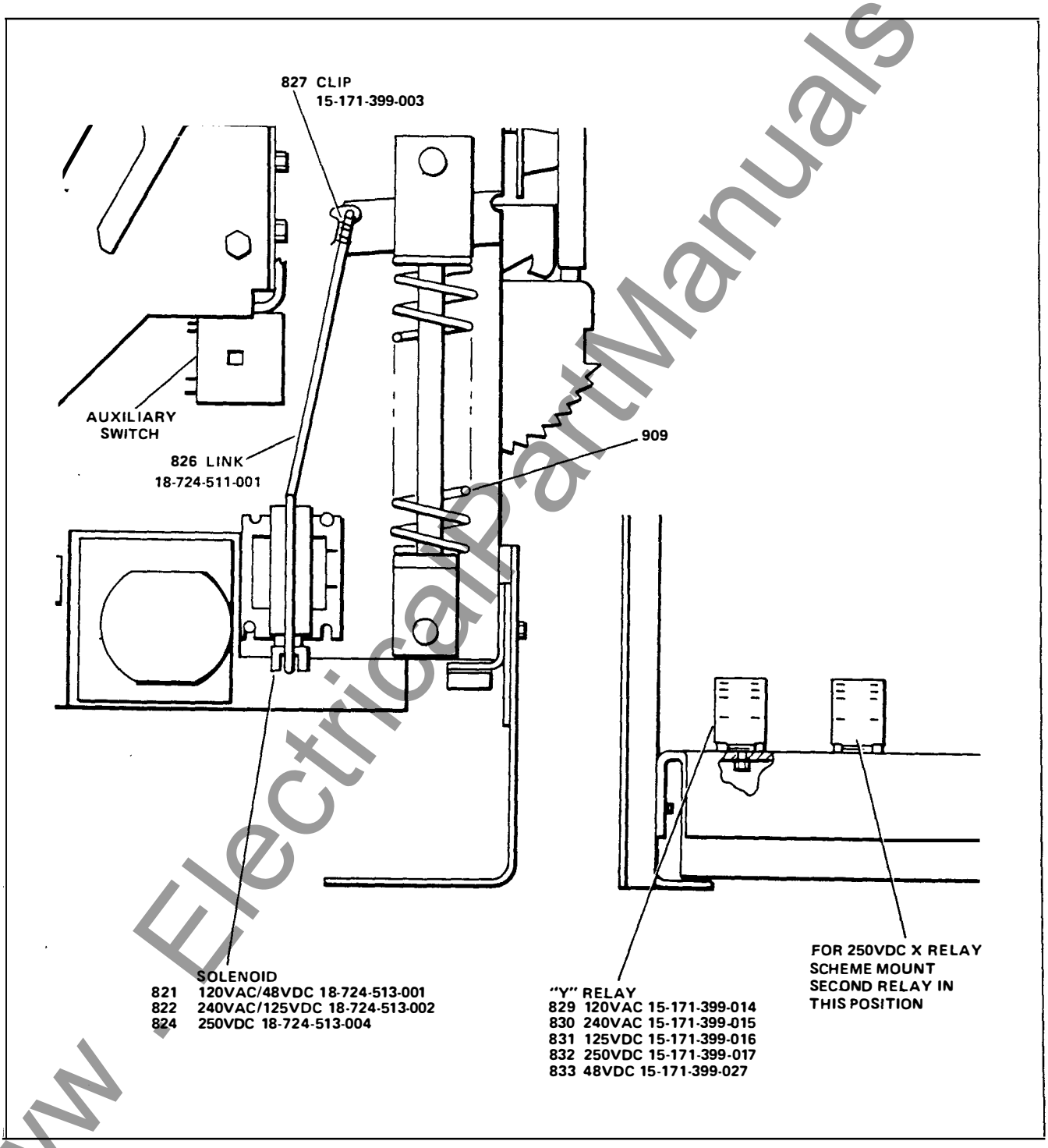

Figure 6. Closing Solenoid and Y Relay

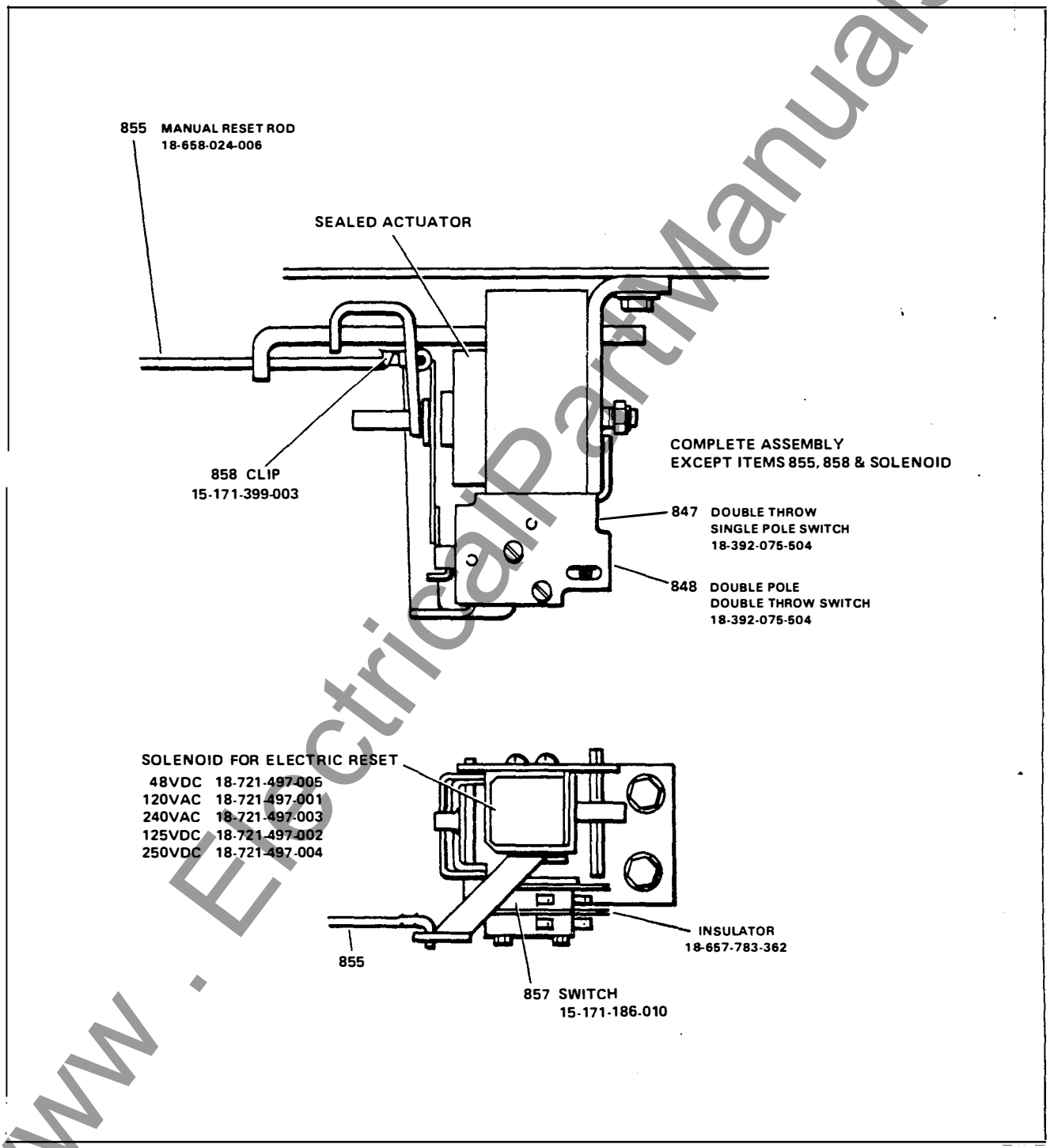

Figure 7. Bell Alarm

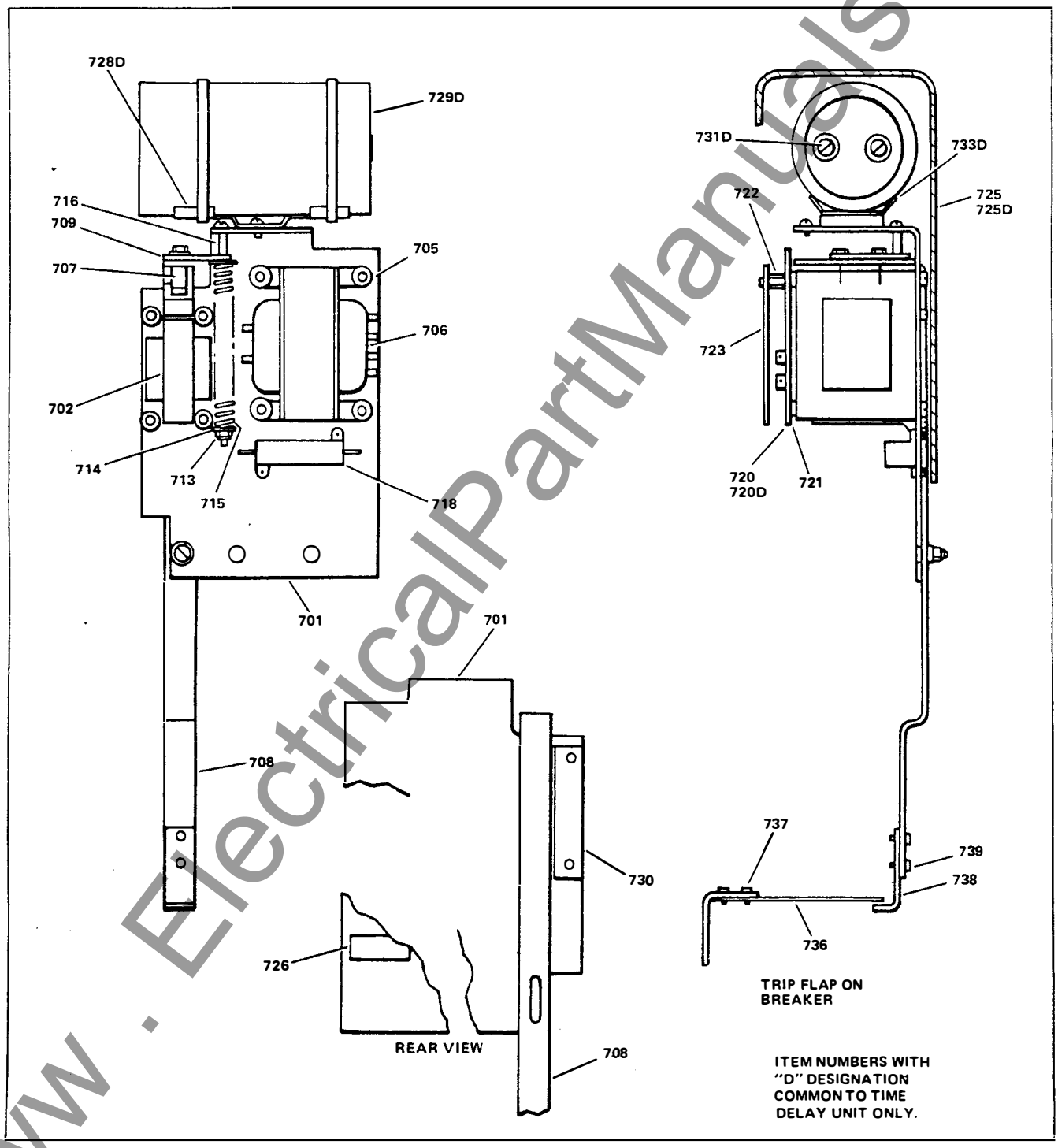

Figure 8. Undervoltage Trip With and Without Time Delay

Item	Description	Part Number
701	UV Base	18-395-032-001
703	Solenoid	18-724-513-007
705	Spacer	18-657-838-298
706	Transformer	15-171-194-001
707	Block	18-657-838-297
708	UV Link	18-727-850-001
709	Plate	18-657-838-296
713	El Stop Nut	00-633-059-210
714	Centering Washer	14-105-442-001
715	Spring	18-657-840-381
716	Screw	15-171-399-038
718	Resistor	15-171-046-015
720	Circuit Bd.	18-395-370-502
720D	Circuit Bd	18-395-370-501
721	Insulator Shield	18-657-840-380
722	Stand Off	18-657-465-036
723	Sub-Cover	18-657-838-295
725	Cover	18-395-033-001
725D	Cover	18-395-033-002
726	Name Plate	18-657-840-382
728D	Cap Bracket	18-729-233-001
729D	Capacitor	15-171-029-016
730	Guide Plate	18-657-853-256
731D	Screws (.25-28) .38	00-615-485-369
733D	Insulator	18-657-854-183
736	Flapper Extension	18-657-854-174
737	Screw #6-32	15-171-074-007
738	Link End	18-657-838-299
739	Screw #10-32 (.5)	15-171-399-010

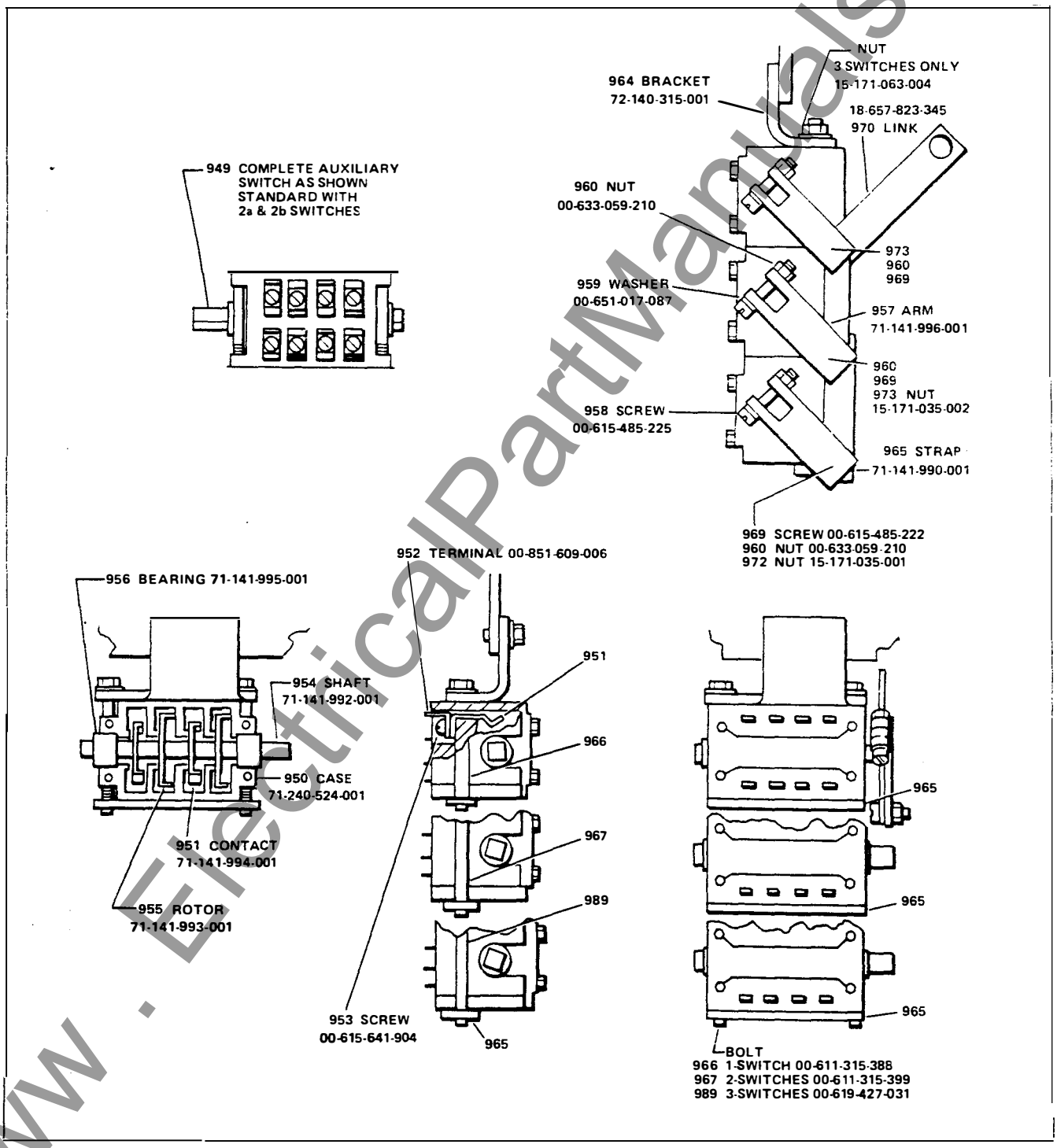

Figure 9. Auxiliary Switch

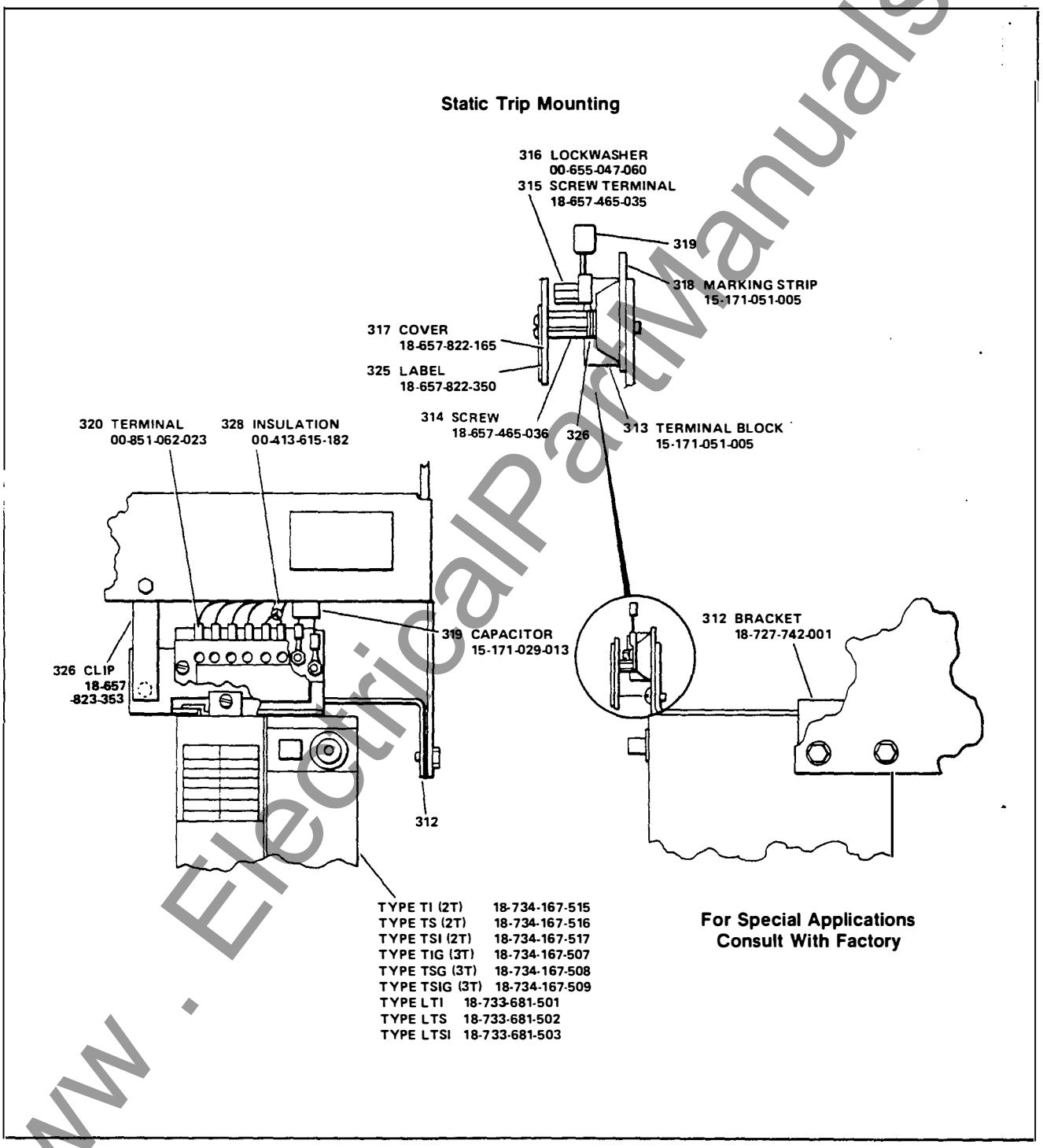

Figure 10. Static Trip and LimiTrip

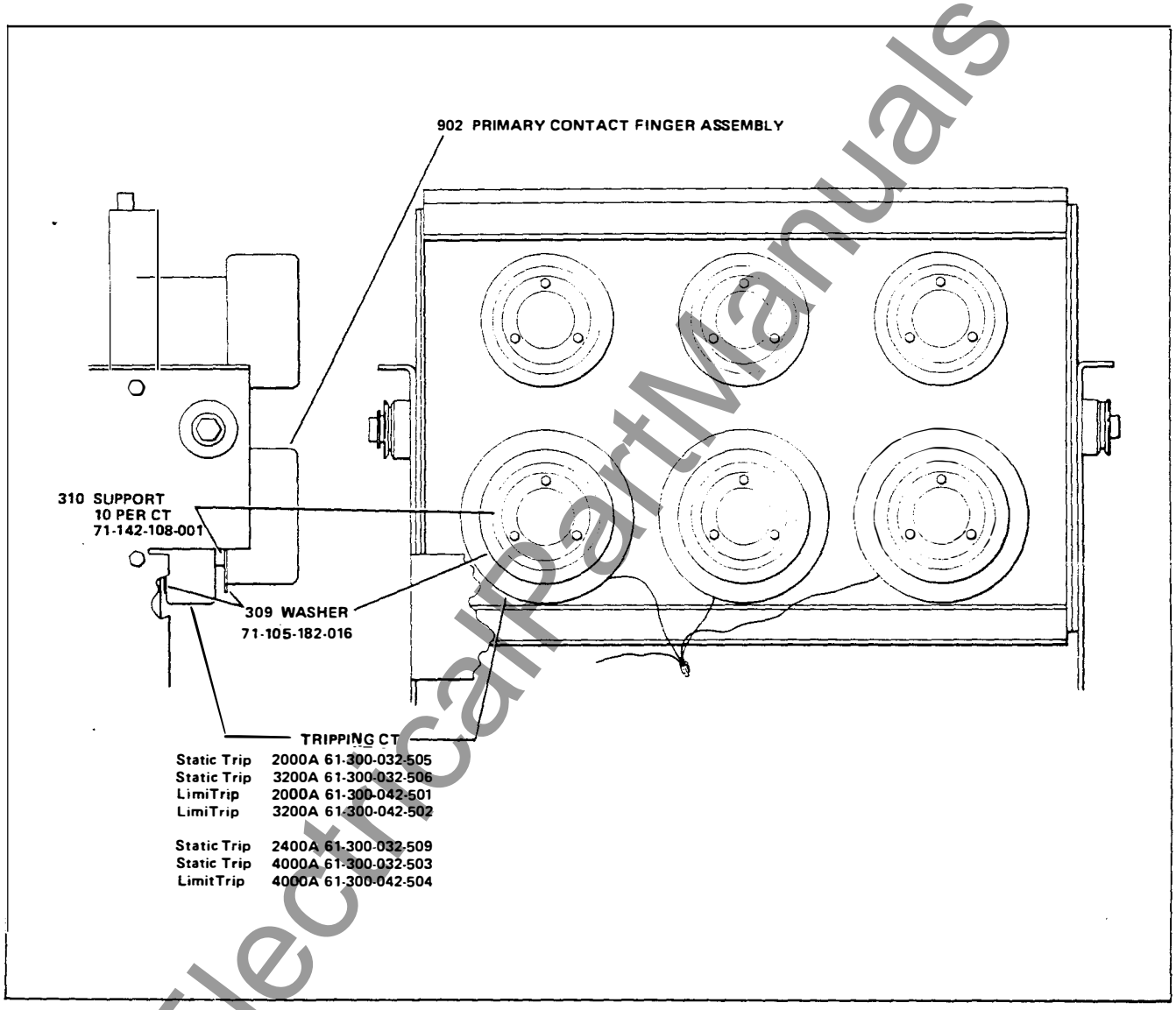

Figure 11. Tripping Transformer